THE

FARMER'S MAGAZINE:

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BRANCH I.

ORIGINAL COMMUNICATIONS.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Advantages of Rivers to this and other Countries.

SIR,

THE rivers of a country contribute greatly to its beauty and to its riches. A purling stream is an established favourite with lovers of rural ornament, occupies a conspicuous part in every page of descriptive poetry, and seems to be a leading feature in beautiful and picturesque scenery. The manufacturer seeks with avidity the bank of a rapid brook, that he may employ the weight of its current in communicating motion to his machinery, and in superseding the use of animal strength. The merchant establishes his warehouse in the neighbourhood of a navigable river, that, in the transmission of his goods, he may avail himself of the cheapness, the facility, and the expedition of water carriage. Farmers, in common with other classes of society, are undoubtedly benefited by the rivers which intersect their fields, as tending to facilitate the general progress of improvement, and as creating, in consequence, an effective demand for the various products of the soil. Still, however, they regard the neighbourhood of a river with an evil eye. They lose sight of its ultimate advantages, while smarting under its immediate injuries. They observe the smallest brook silently wearing down its banks, and incessantly encroaching on the adjacent fields. They have sometimes the mortification to see the larger rivers, and even brooks, when swollen to the magnitude of rivers by a summer storm, inundating an extensive district, destroying the crops in the luxu-

riance of their growth, and covering their finest fields with barren sand. To communicate some instructions which may be of use to avert those calamities, is the design of this paper.

It is evident, that the same mode of management is not applicable to all rivers, or even to every part of any river. The remedy, if effectual, must be suited to the nature of the evil. In correcting the injurious tendency of rivers, however, all that can be effected by art is to introduce a system of palliation. In spite of every human effort, the superabundant moisture which falls on the surface of the earth will run off in those tracks pointed out by nature for its course, and at every flood will carry a portion of the finest soil to the sea. The palliations to be adopted in any instance, must be indicated by local circumstances; such as, the size of the river, the rapidity of its current, and the situation of its banks. A separate account seems necessary of the principal varieties in these respects, as they appear in the climate of North Britain.

Scotland may be characterized as generally mountainous. Its aspect, from being destitute of artificial shelter against the severity of the climate, was long proverbially forbidding to southern strangers. Bleak mountains, in some situations covered with brown heath, in others deformed with grey rocks, were considered as being the leading feature of the country, and as occupying the greater part of its surface. That unfavourable judgment is not altogether the effect of English spleen, or of partial observation. After the utmost effects of Scotish industry and perseverance in extending the system of aration, it was found, in the year 1793, as the result of the inquiries instituted by the Board of Agriculture, that the waste land considerably exceeded what was arable, there being stated about fourteen millions of acres of the former, and only twelve millions of the latter. As the wastes consist almost entirely of land so elevated as to be unfit for tillage, and as the arable land comprehends the skirts of the mountains to the height often of seven or eight hundred feet above the level of the sea, it is evident that the mountainous tracts are of far greater extent than the champaign. It may be stated, also, that those mountainous tracts are not equally distributed over the surface of the country. The most considerable champaign districts are situated in the central counties, and on the eastern coast; while mountains prevail, with few exceptions, along all the western shore, and towards either extremity of the kingdom.

From this account, it is easy to determine the origin and the course of the rivers of Scotland. The breadth of the country is inconsiderable, when compared with the elevation of its mountains.

tains. The rivers must therefore descend with a short and a rapid course towards either sea. It appears, also, that the highest ridge of land, or, as it is provincially called, *the water-shade*, approaches generally to the western coast. This circumstance forms a marked difference between the eastern and the western rivers. The former, from the greater length of their course, are of larger size, and, from flowing through an open country, descend with a gentle stream to the sea. The latter are more rapid and irregular in their course, and are generally ready to fall into the sea, when they have reached the bases of their native mountains.

1. The largest rivers of Scotland are situated in the central counties. Taking their rise in the mountainous districts on the north and on the south, they bend their course through the intervening champaigns, and communicate, by large estuaries, with the sea. Of this character are the rivers Forth, Tay, and Clyde. Agriculture suffers little injury from these at their junction with the sea, and even so far as the tide ascends their course. The agitation of the water, occasioned by the flowing and ebbing of the tide, has hollowed out a channel sufficiently capacious to contain the greatest land floods. It sometimes happens that a river, within the tideway, has a fall so great as to occasion a considerable current, and that this current is so powerful as to pass beyond the centre of the channel, and to undermine the opposing bank. In this case, the usual practice is to plant willows along the vulnerable bank; and the current is thus prevented from washing away the friable earth by the matted roots and depending branches of these aquatics. This evil, however, is of rare occurrence; the injury sustained is but of trifling extent; and the remedy now mentioned, if stones cannot easily be found to make jetties, is the most eligible that can be adopted. Rivers, after meeting with the tide, generally flow with a sluggish and almost imperceptible current. Their banks, instead of being undermined by the agitation of the water, and of assuming a perpendicular form, are gently inclined; and the inclination is so gradual, as to leave an extensive beach between high and low water mark. This intermediate space, from being twice covered every day by the tide, has been tacitly respected by dull farmers as the legitimate domain of the sea, and expressly subjected, by grave legislators, to the code of maritime law. There seems now to be a tendency to consider this claim of the watery element over part of terra firma to be unwarranted—to be an usurpation. As the wants of an increasing population present an urgent demand for every product of the ground, farmers have been encouraged not only to contend with the inclemency of the

climate, and to carry aration so far up the skirts of the mountains as the scanty crop will repay their toil, but also to resist the immemorial sovereignty of the sea,—to erect embankments far within the high water mark, and to say to the swelling tide, *Thus far shalt thou come, and no farther.* The encroachment here is not of rivers upon cultivated ground, but of cultivation on the watery domains: a description therefore of embankments for excluding the tide, falls not within the limits of the present paper. Such of your readers as wish for information on this subject, will be gratified, by consulting the third volume of your instructive Miscellany, which contains a detailed account of a successful embankment executed at the mouth of the Cree, on the coast of Galloway.

2. Another variety may be considered as comprehending the rivers already mentioned, during the higher part of their course, and all rivers of secondary magnitude throughout nearly their whole course. Examples of the latter may be found in the Tweed, Spey, and most other rivers on the eastern and southern coasts. All of those rivers, whether of primary or secondary magnitude, flow along those tracts which are called *Dales* * in the south country, and *Straths* in the Highlands; and which may be described as appearing at first but a narrow interstice between two neighbouring mountains, that gradually enlarges into a winding vale, and towards the coast expands into an open champaign. These level tracts, being composed of the spoils of the surrounding hilly ranges, washed down by torrents, and deposited loosely on the lower grounds, allow the rivers to proceed in their course with a regular fall, and almost uniform motion. Hence the rivers, or parts of rivers comprehended under this variety, may be characterized as flowing with considerable rapidity, and admitting of little other variation than occasionally to rush down with the impetuosity of a stream, and to compensate for this acceleration by the stagnation of the succeeding pool.

An obvious evil in those rivers, is the crookedness of their course. It may easily be conceived, that rivers, by flowing in a straight channel, would occupy a smaller portion of ground, and discharge their tribute of water sooner into the sea: but it does not

* The terms, *Dale* and *Strath*, seem to be of the same Gaelic origin. The former prevails in the South, and the latter is still retained in the North. They are strictly of the same import, if we may judge from common usage; a surer criterion than distant, and often fanciful etymology. What was anciently called Strathclyde, is now Clydesdale; and an extensive parish in that district, is named indiscriminately, from the river Avon, which intersects it, either Strathavon or Avondale.

not appear that their present winding course can receive much improvement from art. The windings, though numerous, seldom vary far from a straight line; rarely forming a complete semicircle; more frequently only a small segment of a large circle. If the object in view, therefore, be merely to gain ground from a crooked river, little advantage is to be obtained from altering and straightening its channel. It is evident, from the well-known proportion between the diameter and the circumference of a circle, that, even in those windings which form a complete semicircle, the extent of ground gained by turning the river from the curve to the cord, amounts only to one-half of the space occupied by the latter. The fee-simple of such an inconsiderable acquisition will, in a few favoured situations only, be sufficient to repay the expense of making a new channel for a river, and of converting the old one into arable ground.

The field of improvement appears, from these observations, to be confined to the present channel: and here no great injury is to be primarily apprehended from inundation. All rivers exert a powerful and a permanent force in enlarging the breadth, and particularly the depth of their channel. Even those which seem almost stagnant,—which flow with a current scarcely perceptible, have, from being confined for ages to the same track, hollowed out a channel sufficiently capacious to contain the greatest flood. This natural tendency must be most powerful in rivers, such as those now under consideration, flowing with considerable rapidity. In them, therefore, the process of excavating a channel must be most speedily accomplished, if it has not been counteracted by some accidental obstacle. Now, the most frequent obstacle is the encroachment of a rapid river on the adjacent fields, and the variation which must ensue in the position of the channel. The friction, if we may apply that term to fluids,—the friction of a river is always greatest at its windings. Water flowing, like every object set in motion, proceeds in a straight line, till it meets some obstacle, and is compelled to assume a new direction. In a winding river, if a strong current be formed, it must, according to its natural tendency, soon be diverted from the centre of the channel; and proceeding outwards, it must at last strike against the exterior bank of the curve, where, in proportion to the impetuosity, will be the effect produced, of washing down the earth of which the bank is composed, and of hollowing out the bed in which the current flows. The appearance which a river presents in such a situation, is, on the one side, a high perpendicular mouldering bank, with a deep pool underneath; and on the other, a bed of sand, deposited by the river there, undisturbed by the current, and almost remaining at

rest. It is at this point, that we generally trace the cause and the commencement of inundations. The sand-bank deposited on the stagnant side of the winding river, diminishes the capacity of its channel; the strong current rushing towards the other side, disturbs the equable flow, and retards the onward progress of the water: in consequence of both, high floods, not finding a free passage in the bed of the river, overflow its banks, and desolate the adjacent plains.

To prevent the encroachment of rivers, it is necessary to strengthen the resistance of the vulnerable bank. For this purpose, willows are sometimes planted along its margin; but their depending branches, by intercepting alluvion, soon contract the channel of the river, and, by increasing the risk of inundation, occasion a greater calamity than that which they are designed to cure. This inconvenience attending willows, points out the propriety of substituting a jetty of stones. The resistance of the bank, however, is thus increased at one point. To afford complete security, it is necessary to construct a series of jetties along the whole bank. These, if stones be distant, are expensive in the erection; and after being erected, require frequent reparations, from being subject to be undermined and swept away by the hitherto undiminished impetuosity of the stream. A remedy, less expensive, and more effectual, might be discovered, if due attention had been paid to the radical evil. This, without doubt, is the obliquity of the current. The chief indication of cure, therefore, is to ascend the river to the point where the current commences, and to remove every obstacle which diverts it from the centre of the channel. In the lower district of Tweeddale, the course of the Tweed has been greatly improved on this obvious principle, by simply removing the large stones from the bed of the river. When this primary operation is effected, by clearing the channel, and conducting the body of the river in the direction of its centre, it is time to attend to the situation of the vulnerable bank; and all that is then necessary, is to reduce its original precipitous form into an inclined plane, and to protect it, under the surface of the river, with a shelving layer of stones.

3. Rivulets are a third variety. Under this head may be arranged the tributaries of the rivers already mentioned, and all rivers, with a few exceptions in the central counties, on the western coast of Scotland. Their name imports, that they are rivers in miniature. Besides this character of inferiority in size, they may be further described as situated in a narrower vale, and descending with greater rapidity. In provincial language, this variety is commonly called *Waters;* that designation being seldom given to the larger rivers, and never to the smaller streams which rush

rush down the mountain's side, and are known by the name of *Burns.*

It might be supposed, that rivulets would flow generally in the lowest part of their narrow glens; and that this track would be at an equal distance from the rising grounds on either side. They are rarely, however, found in this situation. They generally flow along one side of their native vales; and, what seems singular at first sight, bend their course to that side where the hilly range rises most abruptly. So strong is this predilection, that they are often found to vary their course, and to traverse the vale from side to side, in order to regain their favourite situation, and to wind around the base of a steep mountain. If the acclivity be composed of rock, the rains may descend, and the floods may come, but the rivulet will beat against it in vain, and continue to flow harmlessly over its original rocky bed: if earth or gravel be the chief ingredient, every flood makes an encroachment on the mountain's side; and in process of time the rivulet scoops out a precipitous semicircular basin, whose mouldering brink, if unwarily approached by cattle, suddenly gives way under their feet, and dashes them in pieces among the rocks below. The usual remedy here is, to erect a jetty of stones at the point where encroachment begins. The whole body of water in the rivulet is thus dashed against the opposite bank, but is soon repelled to its original situation,—like a ray of light meeting a reflecting substance, where the angle of incidence is equal to the angle of reflexion. A second jetty must be erected, to stem the impetuosity of the reflected current; and indeed, if the precipice be of considerable length, a series of them will be necessary. In such a situation, a rivulet may be said to have attained its *maximum* of desolating power; it flows in a zig-zag direction, rushing incessantly from side to side, and exhausting its impetuosity in ravaging the opposing banks. A simpler remedy is, to abide by the original channel, to straighten it as much as possible by removing every rock or stone, and to defend the acclivity of the mountain, by forming a sloping embankment along the margin of the rivulet. It will be necessary further to protect, in part, this embankment with a coating of stones, as rivulets are so impetuous as to wash away loose earth, and even to tear up matted grass. With regard to the precipitous excavation, if no further encroachment is made, nature, unassisted, will gradually reduce it to a sloping bank, and cover it with suitable herbage.

In the other part of its course, where the rivulet crosses a vale, its evil influences are of greater extent, and more difficult to cure. It flows in a serpentine direction; and in consequence of its rapidity, forms an impetuous current at every winding, which dashes

against the opposing bank, and soon encroaches on the adjacent field. This encroachment is so rapid, that the rivulet varies its course after almost every high flood, forming a new channel in the space formerly occupied by its bank, and leaving the old one filled with a bed of gravel. As the waste on the one side is always accompanied and equalled by the deposition on the other, the channel can never be enlarged by the largest floods, or by the most extensive encroachments. From incessantly varying its course, the rivulet always flows in a narrow, and in a shallow channel; and from the inadequacy of the channel to contain even inconsiderable floods, arises the frequency with which it overflows the adjacent plains. To guard against inundation, as being a greater calamity than encroachment, an embankment is sometimes constructed on each side of the rivulet, and at some distance from its margin. The intervening space, though naturally fertile, is left uncultivated and unproductive, exposed to be covered by floods, and to be ravaged by torrents. Though this costly sacrifice is made for the security of the remaining vale, it is often unavailing to accomplish that humble aim. During some high flood, the rivulet perhaps bursts from its channel, and rushes at once against the embankment; or, though it abide by its ordinary track, yet, in the course of incessant encroachment, it ultimately reaches the same point, where it speedily sweeps away the loose materials of which the embankment is composed, and pours its raging torrent into the defenceless fruitful field. Another remedy, perhaps more expensive, certainly more effectual, has been adopted. If the rivulet flow in a serpentine and a shallow course, it will be adviseable at the first to abandon the present track as incorrigible, and to form a new and a straight channel, of sufficient capacity to contain the greatest flood. If the channel be already straight, or nearly so, it must be adopted as the basis of improvement. Endeavour to bring the course of the rivulet as near as possible to a straight line, as it is only in this case that the body of its water can flow in the centre of the bed, without washing soil from one bank, or depositing sand on the other. Remove every stone, whether great or small, in the channel, and the first flood will sweep away the loose gravel, and uncover another layer of stones: these stones must be also removed; and this operation must be repeated after every successive flood, till the rivulet shall have hollowed out a channel of sufficient depth. Upon this plan, there has been recently improved the course of a rapid rivulet, which intersects the fertile vale of Campsie, in the county of Stirling. In one place, where the rivulet irregularly crossed the vale, Sir Charles Edmondstone of Duntreath has excavated a new channel, without devolving the expense

expense on his neighbouring tenants; and reclaimed a fertile spot, formerly almost waste, from the frequency of inundations. In a higher part of its course, where, from its great rapidity, the rivulet was incessantly ravaging or overflowing its banks, the Rev. Mr Lapslie's father, upwards of thirty years ago, effectually cured both irregularities, *by clodding the water* after every summer flood. By removing every layer of stones successively uncovered, he sunk the channel to such a depth as rendered the adjacent fields secure from inundation; and by laying those stones along the shelving banks, he rendered them invulnerable by the most impetuous torrent.

It is unnecessary to pursue this subject further, and to trace to their sources the minute ramifications of rivulets. Most of these are situated in mountainous districts; and, while rushing down rugged precipices, or gliding unseen through deep ravines, are elevated far above the region of cultivation. Such of them as flow through lower and arable grounds, approach to the character of rivulets, and must be subjected to the same system of management. Before closing this paper, it may be proper to take notice of a case, common to all the varieties already mentioned, and occurring in streams of every intermediate size, from the smallest brook to the largest river, viz.

4. Obliterated lakes. Every river has been described as flowing in a vale of variable breadth. The hilly ranges by which it is bounded on either side, sometimes approach to the brink of the river, and interrupt the continuity of the vale; sometimes cross the channel, come into actual contact, and disturb the uniform progress of the river. Above this natural mound, the river collects its water, and expands into a lake. When it has risen to the top of the mound, it resumes its course, rushing down always rapidly, sometimes precipitantly. The lake, thus completed, is ultimately doomed to disappear. Its depth is gradually diminishing, by the deposition of alluvion brought down by floods; its surface is likewise sinking, from the river incessantly deepening the channel of its outlet. In consequence of both these processes, all lakes, fed by rivers, have declined from their first extent; and many, in the lapse of ages, have been entirely obliterated. The site of the latter, however, can be still recognized, from the river being almost stagnant, flowing in a meandering direction, and forming in its course a series of peninsulas. The adjacent flats, or *haughs*,* as they are provincially called, have

* It has often been remarked, that the Scotish language abounds in terms to express every appearance of nature; and that it is often impossible

have also something peculiar, consisting of a clay soil, rising little above the surface of the river, and presenting the appearance of an unsightly marsh. As another characteristic, it may be further stated, that the outlet is frequently insufficient to discharge high floods; that, from the consequent stagnation, the river covers the adjacent flats; and that, for a time, the lake regains its original grandeur. The improvement of those situations is obvious to the eye, though expensive in the execution. Deepen as much as possible the outlet of the river, which will lower its surface throughout the whole length of the original lake; straighten the channel, by abandoning its winding mazes, and forming a new course across the neck of every peninsula; lastly, if stagnation be not thus prevented, raise an embankment on each side of the river, of sufficient elevation to contain the greatest flood;—and all the expense will soon be repaid by the grateful fertility of grounds consisting of the richest clay, and lying in the most genial situation.

The preceding remarks, Mr Conductor, are handed you for insertion, if your instructive pages are not preoccupied by more useful matters. I am, &c. &c.

Fintry Manse, 30th Dec. 1810. JOHN GRAHAM.

FOR THE FARMER'S MAGAZINE.

Directions given by Mr Craik of Arbigland to Mr Peter Gordon, one of his Pupils, anent the Culture and Management of Kelton-Lodge Farm, near Castle-Douglas, Galloway, 1773. *Communicated by James Grierson Esq. Dalgoner.*

THE first great object in husbandry is, to improve the land to as high a degree as it can be brought, at a profitable expense; and the next is, to bring it into such a course of management as will keep it always up to the same state of fertility, whether in corn or in grass.

As you have the materials of improvement at hand, and a proper soil, which has been in grass for many years, great encouragement is afforded to proceed with vigour in dressing the farm; and the sooner this is accomplished, you will have the longer time to enjoy the profits. In order to this, I would advise you to lay on

impossible to translate these into English. I do not know that the latter has any words equivalent to *haugh* and *holm*. The former expresses a flat formed by a stagnant river, and consisting of a bed of clay; the latter is restricted to a flat, formed by a running stream, of whose soil gravel is the chief ingredient.

on marl the summer before you break up the lea; after which, you may, in the first course, take two crops of oats: after the second crop of oats, plough in the stubble for a winter-fallow as soon after harvest as you conveniently can, and let this ploughing be *pretty deep*. In the spring, cross-harrow the ridges with a break-harrow; and, with a second ploughing and harrowing, the land will be tolerably prepared for a potato crop. Lay so much as you intend for potatoes into four-feet ridges, by making a large open furrow with the double mould-board plough; and into the furrow lay well rotted dung, at the rate of 45 cart-loads to the acre. Plant the potatoes on the dung, and cover them with the plough, and finish the ridges at your conveniency. Horse-hoe, hand-hoe, and hand-weed through the summer; as, on the exact execution of the different operations on the fallow crops, not only the success of the crop depends, but also that of the succeeding crops of grain and grass seeds.

You may prepare for turnips as much more of your fallow as your dung will serve, to be managed in the same manner as the potatoes; and, if any part of your fallow remain, for which you have not dung, be sure to work it well during the summer months, and lay it up into narrow ridges before winter, which are to be cross-harrowed down next spring before the seed-furrow, and sown, alongst with the rest, with barley and grass-seeds, giving at the rate of 8 lib. of red clover seed, 6 lib. of white clover seed, and 1 bushel ryegrass to the acre. If you choose to have a little wheat, you may sow it on that part on which the potatoes were; and you may try white peas, to be horse-hoed, on that part of the fallow for which you have not dung. The Charleton white pea is the most proper for being horse-heed, as the straw is short, and it is a great bearer. In the above manner, go over the whole farm as expeditiously as you can, without returning to break up any of the fields laid down to grass, till the whole is finished.

When this is accomplished, I would recommend the following course of cropping through the remainder of your lease, as best calculated to preserve the land in full vigour, and yield the greatest profit, at the same time that the labour is so divided as not to throw you into any improper hurry.

First, break up the lea with oats. Suppose your farm may contain 200 acres arable, I propose one half to be in white and fallow crops, and the other half in hay and pasture; in this course of management, viz. 33 acres from the lea, broke up and sown with oats broadcast yearly, plough down the stubble before winter, as above; prepare what part of the 33 acres you propose for potatoes, peas and beans, all to be dressed with dung at the rate of

45 two-horse cart loads to the acre, and all to be horse-hoed; the remainder of the fallow prepared for turnips, with the like quantity of dung, and also horse-hoed, &c. After the potatoes, peas and beans, these parts are to be sowed with wheat upon once ploughing; and that in turnips to be sowed in the spring with barley broadcast, and both laid down with grass-seeds as above, —sowing the grass-seeds on the braird of the wheat any time in April. You may take one crop or two of hay the first year of the grass-seeds, or one crop the first year, and another the second year, as you choose. You ought not, however, to take more than two crops of hay during the time the fields lye out in grass; and pasture them afterwards.

The great point to be attended to in this plan, is the procuring a sufficient quantity of dung for dressing 33 acres yearly, at the rate of 45 carts to the acre; and, to obtain this, you ought to have a straw-yard with sheds and hecks for feeding cattle, in which as many should be kept as will eat all the white and green fodder, excepting what will serve your horses. Before putting in the cattle, lay a bottom, two feet thick, of fat earth from the loch, over all the straw-yard; and, after this is well covered with the cattles' dung, lay another layer of earth, a foot thick; and so on, through the season.

In the spring, clear out the straw-yard, and make all up into hillocks in the field which is to be dunged; and it will be well worth your while to give about ten carts of marl to every 35 carts of straw-yard dung, when you make up the dunghill in layers. The dunghills should be turned over once or twice before used on the land, and the whole well rotted and mixed: in short, I consider the whole success of the scheme to depend upon giving due attention to this part; though, at the same time, the accurate execution of the different operations is of great importance.

As it will be some time before dung can be got for dressing the whole fallow, I think it will be a saving to drill turnips even upon that part for which you have not dung. Perhaps by using marl and applying the horse-hoe, a tolerable crop may be got, though not equal to that of the dunged part; and if the turnips should totally fail, you can still go on with the summer-fallow of that part. Upon the whole, remember that a sensible farmer will neither grudge pains, trouble nor expense, provided he has reason to believe that a suitable return of profit will be received; and, to ascertain this, it is necessary to consider maturely both the extent of the expense, and the probability of a profitable return, before you engage.

Average Value of the Produce of a Farm of 200 Acres, of which one

one half is always in Crop or Fallow, the other half in Hay and Pasture.

Acres.					
33, from lea, in oats, at 4*l.* p. acre	L. 132	0	0		
4 in potatoes, horse-hoed, at 7*l.* p. do.	28	0	0		
6 in white peas, horse-hoed, at 2*l.* p. do.	12	0	0		
23 in turnips, horse-hoed, at 2*l.* p. do.	46	0	0		
10 in wheat, on the potato and peas part, at 7*l.* p. do.	70	0	0		
23 in barley, on the turnip land, at 5*l.* p. do.	115	0	0		
100 in hay and pasture, at 25s., when fully improven and laid down with grass seeds	125	0	0		
199				L. 528	0 0

Rent, Seed and Labour on Ditto.

200 acres, at 15s. p. acre	L. 150	0	0
To 3 ploughs and 2 horses each, and the ploughman to hold and drive—For mens' wages, maintenance of horses, and wear and tear, at 30*l.* each	90	0	0
To seed for 33 acres of oats, at 6 Winchester bushels p. acre, at 2s. 6d. p. bushel	24	14	0
.. Ditto for 4 acres potatoes, at 6 Dumfries pecks p. acre, at 1s. 6d. p. peck	1	16	0
.. Ditto for 6 acres white peas, 1½ bushels p. acre, drilled in two rows, at 5s.	2	5	0
.. Ditto for 23 acres turnips, 1 lib. p. acre, at 1s.	1	3	0
.. Ditto for 10 acres wheat broadcast, at 3 bushels per acre at 5s. 6d.	8	5	0
.. Ditto for 23 acres barley, at 3 Winchester bushels per acre at 2s. 6d.	8	12	6
.. Red clover seed for 33 acres, at 8 lib. per acre, at 5d. per lib.	5	10	0
.. White clover seed for do. 6 lib. per acre, at 8d. per lib.	6	12	0
.. 33 Winchester bushels ryegrass seed, at 1 bushel per acre, at 4s.	6	12	0
.. Shearing, binding and stooking 66 acres wheat and barley, at 6s. per acre	20	0	0
.. Planting and raising 4 acres potatoes, at 1*l.* per acre	4	0	0
Carry over	L. 329	9	6

Brought over	L. 329	9	6
To Reaping and binding 6 acres peas, at 6s.	1	16	0
.. Setting out and hand-hoeing 23 acres turnips, at 2s. per acre	2	6	0
.. Mowing 33 acres of grass, at 2s. per acre	3	6	0
.. Winning do. at 2s. per acre	3	6	0
.. 2 women servants for meat and wages, at 8*l.*	16	0	0
.. Interest of 400*l.* stock	20	0	0
.. extra work at sundries	30	0	0
	L. 406	3	6

Produce gross as above	L. 528	0	0
Rent and charges	406	3	6
Nett profit	L. 121	16	6

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Letter from James Grierson Esq.

SIR,

THE originals, all in Mr Craik's handwriting, from which the above was taken, are handed to me by Mr Gordon of Glenstockadale, Galloway, once pupil to Mr Craik, and were written for his direction on entering to a considerable farm. Mr Gordon says, he was at Arbigland in the years 1772–3; that Mr Craik then occupied about 200 acres, all of which were managed much in the way he describes, and kept as clean as a garden by horse and hand-hoeing and hand-weeding. His crops were most luxuriant; but, being much afflicted with gravel, he, in the year 1774, let off the greatest part of it, for which he was to receive three fifths of the produce as rent, the tenant to find seed, labour, &c.; but Mr Craik complained that the tenant was indolent and inactive. He soon gave up, and the farm was set in the usual way; though the lease was so arranged, that two crops of the same kind were not to succeed each other. There was much waste land on the estate, which he was then bringing into culture; but the soil being cold and wet, great expense was occasioned. The drains he made were about four feet deep and three wide, which were half filled with stones. The cattle he kept at that time were of the horned English breed; though, Mr Gordon thinks, not of the Bakewell sort, which before this time were given up. After all the experiments made, Mr Gordon says, that Mr Craik approved most of the Galloway breed; and that, at his desire, he (Mr Gordon) sent him a handsome Galloway bull and some heifers, which he preferred to any stock he ever had. He sowed

all

all his oats and barley with a four-coultered drill-wheel, and frame, that went on the fore part of the beam, so tempered, that the horses went in a line in the furrow, in order that the land might not be trod. He did not then use oxen in the plough, but was determined to try mules; and actually covered two of his mares with a very fine jackass of the late Mr Oswald of Auchincruive; but Mr Gordon never heard how the experiment succeeded.

Mr Craik was constantly with his labourers when he had not company, which was seldom the case; as, in the summer and harvest, gentlemen from every quarter called to see his improvements.

Sir, your most obedient servant,

Dalgoner, 23d January 1811. JA. GRIERSON.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Mr Stirling's Thrashing Machine defended.

SIR, *Dumbartonshire, May* 3. 1811.

IT is because I am convinced of the impossibility of judging correctly of any piece of mechanism, without keeping in view the principles of mechanics, that I have been induced to make the following observations upon the merits of the rival thrashing-machines, and to request of you to give them a place in your Magazine. If what I am to advance, should have the effect of inciting some of your correspondents to enter into an examination of the subject, in the only way in which we can hope to arrive at the truth, my object, in giving you this trouble, will be fully attained. Whatever may be decided on the question at issue, the interests of practical mechanics cannot fail to be advanced, should a candid discussion of it be published in your widely circulated Work.

I am of opinion, then, that the thrashing-machine invented by Mr Stirling is, in several respects, superior to the one invented by Mr Meikle; and I now propose to state the grounds upon which I rest this opinion, avoiding all facts but such as may be observed by any man, however ignorant of theoretical principles.

In all thrashing-machines, the force exerted by the moving power must be expended upon the corn in one of two ways. The number of strokes may be small, and the velocity great; or, the strokes may be more numerous, and the velocity proportionally small. Now, it appears to me, that the same force will produce an incomparably greater effect, when expended in the former way, than when expended in the latter; for the separation of corn from the straw, by the stroke of a scutcher, is pre-

cisely the same kind of operation with the breaking of a stone, or of any brittle substance by the blow of a hammer. If the velocity of the stroke is less than that which is just sufficient to effect the separation, it may be repeated ten times without accomplishing the purpose; while the force expended in the one effective stroke is very little greater than that expended in each of the others.

But it is alleged, in opposition to this, that when the velocity of a thrashing-machine is very great, the straw acquires such power in retarding motion, as to render all attempts to separate the corn from it in this way a mere wasting of strength. Now, the resistance made by the straw can arise only from its inertia, its gravity, its elasticity, and its friction upon the scutchers. And it may be easily shown, that, as far as inertia is concerned, the resistance given to a stroke is directly as the square of its velocity; that as far as gravity is concerned, it is inversely as the velocity; and that, as far as friction is concerned, the resistance is the same at all velocities. Now, as the sum of the pressure caused by these properties of the straw is thus proved to increase with the velocity, in a ratio inferior to that of its square, the friction caused by that pressure must follow the same proportion. So far, then, is the force from being wasted upon the straw, when the velocity of the stroke is great, that the greater this velocity is, the smaller is the proportion of the force exerted, which is expended in overcoming unnecessary resistance.

In this respect, then, the scutch-mill is greatly superior to the drum-mill. In one of them which I have seen, the horses make 3 revolutions in 1 minute, and the spindle makes 193.44; and consequently, that point of the scutchers which strikes the middle of the handful of corn, and which is about 3 feet 6 inches from the centre of the spindle, moves over a space equal to 4252.97 feet in that time. In a machine of Mr Meikle's construction in the neighbourhood, if the horses make 3 revolutions in 1 minute, the drum makes 340; and its diameter being 3 feet 9 inches, the velocity of the scutchers is 2937.37 feet. Here, then, the difference is very considerable; but I believe it will be found to be in reality greater: for I have never seen a thrashing machine of Mr Meikle's, in which the horses make 3 revolutions in a minute; in many they make scarcely more than two.

It is objected to the scutch-mill, that, as all parts of the handful of corn are not applied at the same distance from the centre of motion, and consequently are not struck with equal force, they cannot be all equally thrashed. But the force of this objection will scarcely be felt, when it is considered that the length

of the aperture through which the corn is introduced into the thrashing-box, is not more than 15 or 16 inches; that the corn is seldom spread over the whole of this extent; and that the impulse which it receives from the stroke, tends constantly to drive it towards the circumference of the circle.

But a more serious objection has been founded upon a peculiarity in the construction of this machine; and, if mechanical properties had any share in directing the choice, this peculiarity has been one great cause of the preference which is given to the drum-mill. While, in the former, the corn is collected into a space not exceeding one foot; in the latter it is spread over an extent of four or five. Now, the objection founded upon this circumstance is by no means so formidable as it may at first sight appear. For as the number of strokes necessary to separate corn from the straw is much smaller in the scutch than in the drum-mill, the corn passes through the former in half the time in which it passes through the latter: so that if the scutch-mill be properly fed, the quantity of corn exposed to its action at the same instant need not be more than one half of that which must be applied to the drum-mill.

But, further, this circumstance in the construction of Mr Stirling's machine, can be disadvantageous only in two ways. It may increase the power of the straw in impeding the motion of the machine, and it may render it more difficult to separate the corn from it. It cannot, however, produce the former effect, if the distance from the scutchers to the feeding rollers, or that which occupies their place, is not as small as it is in the drum-mill; and fortunately this is by no means the case; for while, in this last, it is scarcely one inch, in the scutch-mill it is not less than two and a half, or three.

It would be difficult to show, from mechanical principles, that the collection of the straw in a mass does not render it more difficult to strike out the corn; but some light may be thrown upon the subject, by considering a case exactly similar. I have never observed that professed thrashers take great care to spread out the corn before they apply the flail: on the contrary, they take considerable pains to keep it from being spread during the operation of thrashing. Now, if the spreading of corn renders it much more easily thrashed, it is very surprising that this fact should so long have escaped the attention of those who have so many opportunities of discovering it, and so many motives to reduce it to practice. It may fairly be doubted, then, whether this circumstance in the construction of the scutching-mill is not a perfection, rather than a defect. At any rate, the disadvantages, if any, arising from it, are so small, as to be greatly overbalanced by the following advantages.

In the scutch-mill, the corn, after being struck, is left in a horizontal position, which is the situation where its weight acts most powerfully in bringing it back to its place; and, as the strokes are not so frequent in this as in Mr Meikle's machine, there is more time allowed for the gravity and elasticity of the corn, to place it in the situation where it may be struck with advantage. The consequence is, that no external force is necessary to support the corn in receiving the stroke; and by this means all unnecessary resistance and friction are avoided. Let any man examine the immoveable cover of the thrashing-box in Mr Stirling's machine,—placed at such a distance as never to be felt by the scutcher,—not acting upon the straw till the scutcher has passed over it, and yet bringing it back in such a manner as to receive a most effectual blow; and, I think, he cannot fail to prefer the mode of its operation to the continual pressure and obstruction given by the cover of Mr Meikle's.

There is an argument used by those who oppose the use of the scutch-mill, which would not deserve attention, if it were not as remarkable for the zeal and industry with which it is continually repeated, as for its total want of foundation in fact. It is repeatedly alleged, that it is essential to the nature of this kind of thrashing-machine, to separate corn from the straw in a very imperfect manner. After what has been said about its velocity, no man can well doubt of its capacity to perform the operation completely. But, in using a thrashing-machine without feeding rollers, where the execution must depend so much upon the attention of the person feeding, it is not surprising that he should sometimes contrive to pass a quantity of grain through it, without being effectually thrashed: and it is by no means without a parallel in the history of human conduct, that he should ascribe that to the defects of the machine, which he ought to place to the account of his own carelessness. But the want of feeding rollers is not essential to the existence of a scutch-mill; and I have no hesitation in saying, that, when these are used, the work performed by it is, in every case, performed to as good purpose as that which is done by any machine whatever.

Upon the whole, it appears to me, that, if men had been guided in their choice by a regard to mechanical advantages, and not influenced by circumstances altogether unconnected with the intrinsic merits of the two implements, the thrashing-machine invented by Mr Stirling must have enjoyed that place in the public estimation, which is at present occupied by its more fortunate rival. I am, Sir, yours sincerely,

MECHANICUS.

Though

NOTE BY THE CONDUCTOR.

Though quite satisfied that the drum-machine is best calculated for executing the arduous task of separating corn from the straw in a complete and perfect manner; yet, as the above defence of the scutching-mill is written with much candour, and throws additional light on the merits of that implement, we have been induced to give it a place, more especially as such discussions tend always to promote improvement, if carried on with that temper and discretion so conspicuously displayed in the foregoing communication. Some observations upon the mechanical principles of our correspondent will probably appear in next Number. N.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Description of the Thrashing Machine invented by Mr Stirling.

SIR,

As the subject of thrashing machines has lately occupied a considerable share of your attention, you may perhaps find a place in your Magazine for the following account of one, in some respects different from any that have yet fallen under your notice. It is of the kind called Scutching-mills, originally invented by Mr Stirling, and has been employed for several years by a farmer a few miles distant from this place.

The horses walk in a circle 22 feet in diameter, and make 3 circuits in a minute, which is at the rate of 2.356 miles per hour. The scutchers are 4 in number, and make 193.44 revolutions in a minute; and their extremities, describing a circle 8 feet in diameter, move with a velocity of 4861.68 feet in that time. The feeding rollers are 15 inches long; and their circumference, at their slowest motion, moves over a space of 1.44 inches; and their quickest motion, of 1.98 inches, for each stroke of the scutchers; that is, at a velocity of 92.85, or 127.67 feet per minute; and their distance from the scutchers is $2\frac{1}{4}$ inches.

Those who use the scutching-mill consider feeding rollers as unnecessary; though I am free to say, they have been found of great advantage. They give ease to the person feeding, render the machine more easy to move, and make it thrash more clean. The greater part of the corn falls through a heck, placed round the inside of the thrashing-box, about 14 inches below the scutchers; and the straw being carried forward, above the heck, three-fourths of the circumference, by an arm fixed in the same axle with the scutchers, is thrown out of the box upon a shaker,

where the remaining part of the grain is completely separated from it, and conveyed downwards into the fanners by a sloping plane fixed to the shaker; while that part of the grain which passes through the heck, in the box, is carried 2½ feet towards the centre by a conical hopper; and by a continuation of one side of the said hopper, it is conducted to the fanners.

The shaker just mentioned is a sort of heck, the bars of which are crossed by wires in a particular manner, and which is moved backwards and forwards about 2 inches by a force that is quite inconsiderable. The leaves of the fanners are placed upon the lower end of the spindle; by which means some friction is avoided, while the fanners may be erected at a smaller expense.

The machine above described is drawn by 4 light horses; and, though the owner has not made trial of how much *might* be done by it in *one* hour, yet he has accurately observed, that, in thrashing crop 1810, as far as it is yet done, the quantity of oats per hour has been from 5 to 8 bolls, and of barley, from 4½ to 7 bolls, Linlithgow barley measure; and that of wheat, from 4 to 5 bolls Linlithgow wheat measure. All these grains were separated from the straw, as completely as done by any machine; and the horses were worked in such a manner, as to be able to continue their exertions for several hours without inconvenience. I may further add, that the expense of erecting a new machine equal in power to the one above-mentioned, would, to the best of my information and judgment, be about 50*l.* Sterling.

If the foregoing account should excite your curiosity, so as to make you wish for a more particular description, I am at all times ready to comply with your wishes. And am, Sir, yours, &c.

Perth, June 3d 1811. M.

NOTE.

The Conductor thanks the gentleman who favoured him with the above account of the machine originally invented by Mr Stirling, and will be happy to receive any further information concerning an implement which, from the concurring testimony of many people, may be used with advantage in those districts where the size of farms is small, and the stock of the occupiers inadequate to the erection of more complete machines. The expense of erecting a scutching-mill, condescended upon, is something like the truth, and meets with instant credit; whereas, when 5*l.*, or 10*l.*, or even 20*l.*, was spoken of as the cost of these machines (and these sums were actually condescended upon in some papers sent us last year), truth seems to be disregarded; and if so in one point, little credit could be given to what was asserted respecting

respecting the quantity and quality of work which the scutching machine was capable of executing. N.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Reply to Observations on Smearing Sheep.

SIR,

IN looking over your Magazine (vol. XI. p. 320.), I was ſurpriſed to ſee that a gentleman (if I may call him ſo) had made ſeveral obſervations concerning the management of ſtoremaſters and their herds with reſpect to ſmearing of ſheep, a practice conſidered by him as totally unneceſſary. Were he right, it is ſtrange that ſtoremaſters ſhould have ſpent ſo much time and money in ſmearing their ſheep, eſpecially as this gentleman undertakes to prove, that both ſheep and wool would be a great deal better, were the ſheep only anointed with tobacco liquor, inſtead of being ſmeared with a mixture of tar and butter. I find he pins his faith to the ſleeves of the great Mr Luccock, woolſtapler, and one Mr A. S. ſtoremaſter at Croſswoodhill in Mid-Lothian, conſidering the opinions of theſe gentlemen as ſomething like goſpel, and, what they have aſſerted, to be equally unalterable as the laws of the Medes and Perſians. He alſo modeſtly ſuppoſes, that himſelf and the before-mentioned gentlemen have all the judgment of the world, and maintains that the ſtoremaſters are ignorant and perverſe, and that their ſheep are much more eaſily managed than either themſelves or their herds. He likewiſe maintains, that the ſtoremaſters wiſh to perſuade you, that wool is made better in quality, and increased in quantity, by ſmearing; and proceeds to ſay, that ſuch things muſt be contrary to truth, as they are in direct contradiction to what is affirmed by the infallible Mr Luccock, and his ſupporter Mr A. S. Nay, he ſays that the Eaſt Border ſtoremaſters will impudently aver in your face, that the woolſtaplers will give nearly the ſame price for tarred as for untarred wool, and expreſſes his ſurpriſe how they can imagine the woolſtaplers to be ſuch fools as to value tar at the ſame price as wool; and he even dares them to ſay ſo in oppoſition to that infallible and eminent woolſtapler Mr Luccock. To hear this ſelf-conceited Lana Alba ſpeak, you would think that this Mr Luccock was a man of great underſtanding, and that we ſtoremaſters are, in his eyes, as it were, born of yeſterday. He forgets, however, that old and true ſaying, that experience is the beſt ſchoolmaſter; and ſhows ſo much ignorance, that I am aſſured he is not a ſtoremaſter. Had he even been a gentleman, he would have uſed better language when ſpeaking of ſtoremaſ-

ters; and would have thought it disgraceful to allow such words as are contained in his communication, to fall from his pen. When he asserts that the East Border storemasters say and uphold it as a fact, that woolstaplers in general will give very little more for untarred than for tarred wool, he declares what is a perfect fact, and, as such, is well known to the whole world, at least to that part of it concerned in the wool trade. Last year, most of my wool was white or unsmeared, which required from two and a half to three fleeces for every two stone weight more than that which was smeared, while the price of the former did not exceed that of the latter more than four shillings per stone. Any of my neighbours who have tried the anointing of their flocks, whether of the Black-faced or of the Cheviot breeds, have now given up the practice, under an impression that they have been great sufferers by it, and are resolved not to repeat it; not because the weight of wool is lessened, but because the quality thereof is affected, turning gradually coarser; while, from the want of smearing, the scab has been introduced and encouraged, and perhaps may not be quite eradicated for several years to come. Your correspondent discovers much ignorance, or is badly informed as to the expense of smearing. He says, that each sheep well smeared costs tenpence; whereas, high as both tar and butter are at present, it does not cost more than sevenpence. Ten pints of tar, and twenty-four pounds of butter or palm oil, (the latter I would rather prefer), may be, and is considered, on an average, as sufficient for smearing sixty sheep. Now, supposing tar at 1s. per pint, and butter or oil at 1s. per lib., the whole expense of sixty sheep amounts only to one pound fourteen shillings; and there is no other expense necessary, as the herds are bound to smear their flocks. In short, I am inclined to think that Lana Alba is not a storemaster, but either a man of great property, who does not regard money, or a fool, who wishes to hear himself talk, otherwise he would not have spoken of storemasters preferring the manufacturing interest of the country before their own; nor would he call from 40l. to 100l. a year a paltry gain; as every storemaster who clips twenty packs of smeared wool would gain forty pounds Sterling; and in proportion to his clip will his gain be regulated. Many storemasters (too many indeed) have of late taken land, who would be glad of 40l. of clear profit, even when a rent as high as 1000l. per annum is paid; it being consistent with my knowledge, that several of them have of late incurred considerable losses, instead of gains or profits, though they are obliged to pay to Government two shillings per pound upon the half of their rent, as if they actually enjoyed that income. Why should the storemaster and farmer not be allowed to give oath upon the extent

tent of their income, as well as the merchant and manufacturer? It is to be hoped, however, that Parliament will ſoon take this matter into ſerious conſideration, and relieve the tenantry from ſuch a prepoſterous and abſurd mode of eſtimating their incomes reſpectively.

Your correſpondent further ſtates, 'that, if a ſtoremaſter tries the experiment of anointing his flocks with tobacco liquor, and ſuſtains a loſs by ſo doing, he may conſole himſelf by reflecting, that it was done for the good of the country.' There is no reaſon, however, to think that he would try the experiment a ſecond time for the good of the country, provided tar and butter could be obtained. He goes further, and impudently tells us, that the Eaſt Border ſtoremaſters *condemn before trial;* and adds, in language neither proper nor handſome, that this is a ſpecimen of *Border juſtice.* I am not a Border ſtoremaſter, my reſidence being in Ettrick Foreſt; yet I am perſuaded that many others beſides myſelf have tried the anointing of their flocks, and have aſcertained, by dear-bought experience, that the practice ought not to be followed. Your correſpondent alſo mentions Mr A. S.'s ſheep-houſe, which he calls a very bright and meritorious invention, and ſays that, ſo far as he knows, there is not one of them in the ſouth of Scotland; and indeed, in my opinion, there never will be one of them erected, unleſs it is conſtructed upon better principles than thoſe he deſcribes. A dry ſtone wall will do where the houſe is open above, as is the caſe in round ſtells; but, when covered with a roof, will by no means anſwer in a ſtormy country. The chance is, that it will fall above the flock in a driſty night, or, at leaſt, that it will ſoon be filled with ſnow, and the ſheep of courſe be ſmothered.

Notwithſtanding of theſe remarks, I approve of Mr A. S.'s ſheep-houſe, when caſt with lime, as the ſnow will be prevented from getting through the walls, providing the work is properly executed; though I would prefer walls built with ſtone and lime, which would not coſt above ſix pounds of additional expenſe. Dry ſtone walls, caſt with lime, would anſwer very well for the ſtells at each end of the houſe. Mr A. S., in his letter to that worthy gentleman Sir John Sinclair Baronet, ſays, 'I believe my ſtells at each end, and the houſe, will hold forty ſcores of sheep;' though, in my opinion, there ſhould be no more ſheep in one houſe than what it will contain with eaſe; as, in what better ſituation are the ſheep that lye in the ſtells, than if they lay behind a wall in the open fields? A houſe of the ſize of Mr A. S.'s conſtruction, that is, 81 feet long, and 15 or 16 wide, will hold nineteen or twenty ſcores of ſheep with ſafety, but not more; for if a greater number is *crammed* (your white wool correſpondent's term) into the houſe, they will be ſo throng, as to receive more harm

than if they had remained all night in the open air during a ſtorm. In ſhort, I may ſay of Mr Lana Alba, what the great Mr Luccock ſays of tarry wool, that he is thin, rough and weak; for undoubtedly he knows very little about the putting of sheep into a field ſtell, or houſe, otherwise he would not have used the word *crammed*, when offering his advice to ſtoremaſters and herds about the management of their flocks. As for the abilities of our ſtoremaſters and their herds, little need be ſaid; they know their buſineſs, and that is enough. Very probably few of them have got a liberal education; though, had they been ſo fortunate, it is likely that, inſtead of going with their plaid and dog attending ſheep flocks, many of them would have been making a figure in the world equal to what is done by other claſſes.

It ſurpriſes me much to hear Meſſrs Lana Alba and A. S. diſplay ſo much ignorance, when they allege that Ticks and Cades are the ſame; and I agree with the Border Shepherd, who maintains, that thoſe who ſay ſo are at the best but ſtupid fellows. If I may be allowed the expreſſion, they might with equal juſtice aver, that lice and crabs are the ſame; whereas it is well known that the crab and tick take hold of one place, and, if not diſturbed, continue there for days and nights together without ſtirring, whilſt lice and cades conſtantly travel from place to place in queſt of food. If, therefore, theſe gentlemen would but allow themſelves to think for a moment, they would ſoon be convinced of their error, and yield the conteſt in favour of the Eaſt Border Shepherd. I have perhaps intruded too much upon your patience; but, before concluding, would earneſtly entreat your correſpondents to give up what they call their laudable exertions concerning the anointing of ſheep with tobacco liquor, as the generality of ſtoremaſters are already too well convinced of the folly of ſuch a practice, to give them any hope of ever getting it introduced in preference to ſmearing with butter and greaſe,—the moſt effectual means of preventing ſcab and other diſeaſes in that moſt uſeful and valuable animal the ſheep.

I am yours, &c.

THE STOREMASTER'S WELLWISHER.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Origin, Qualities, and Uses of Moss Earth. By William Aiton, writer, Strathaven; being an Epitome of his enlarged Publication, now in the Press, on that Subject.

SIR, *Strathaven, 20th June,* 1811.

THE celebrity which your Magazine has ſo juſtly acquired, and the great extent of its circulation, renders it the moſt proper channel

channel through which I can attempt to direct the views of my countrymen to a branch of agriculture, which, I humbly think, has not yet met with attention any way suitable to its vast importance—I mean the reclaiming of waste land, particularly that part of it which is covered with *moss earth*. If we consider the prodigious extent of surface now covered with moss-earth in Scotland, and the injurious effects which it has upon the climate, the subject will not appear unworthy of serious consideration.

Unless an actual survey were made, it is not possible to speak with any sort of accuracy as to the extent either of that species of soil, or of other descriptions of *waste* land in Scotland. The Board of Agriculture, on the authority of county surveys, and other information considered to be correct, stated the waste land in North Britain, some years ago, at upwards of *fourteen millions of acres*. But from the investigations and surveys which I have made on that subject, to enable me to draw up a rough draught of the chapter on Waste Lands, in the general Report to be laid by the Board before the King and both Houses of Parliament, I am inclined to estimate the waste land in Scotland at upwards of *twenty millions of acres*; and that a very large proportion of that species of land is covered more or less with moss-earth. The recovery of even a small part of these extensive wastes must therefore be a matter of great importance, not only to the proprietors and occupiers of such land, but also to the public.

The injurious effects which such vastly extended ranges of uncultivated moss-earth have upon the atmosphere, by the chilling damps that they send forth, which lower its temperature, and benumb vegetation in the neighbouring fields, render the subject deserving of notice, and ought to stimulate proprietors to make every exertion to remove these injurious effects by cultivation.

Leaving the other species of *waste* land to be noticed in some future communication, I shall offer a few remarks, 1. On the origin; 2. On the qualities; 3. On the uses of moss-earth; and, 4. Mention a few instances of successful moss-culture in different parts of Scotland and England.

I. *On the Origin and Classification of Moss.*

This subject having been in some measure explained, in the answers written by me to some queries anent that substance, which appeared in the XXXVIIth Number, and which you had the goodness to insert in the XLIId Number of your Magazine; and the subject being more connected with natural history than agriculture, I shall not at this time enlarge on it. Let it suffice to say, that moss is neither an original earth, a submarine production, a collection of antediluvian herbage brought together by Noah's flood,

flood, nor a growing plant *sui generis*; but that it is an immenſe collection of vegetable matter, the remains of many ſucceſſive crops of the aquatic plants which have grown on the ſurface, year after year, in places where too much moiſture for the growth of more valuable herbage was detained, and where the temperature was low. Wherever land in the frigid or temperate zones is laid under much moiſture, all the rich graſſes diſappear, and marſh or aquatic plants form the chief or only herbage. Theſe do not, like the more valuable plants, yield ſpeedily to putrefaction; but, from the acids, tanin, extract, or other antiſeptic qualities which they poſſeſs, hold out againſt all the powers of that deſtroyer of plants, and preſerve, for many centuries, ſomething of their organic texture; or, if that be deſtroyed, at leaſt ſome part of their ſubſtance remains in a mucous ſtate, and adds, one crop after another, to the depth of the moſs-earth.

The depth of the moſs ſtratum will be always found to be in proportion to the extent of the ſtagnation of moiſture over the ſurface. Where the ground has conſiderable declivity, or the ſubſoil is open and permeable, the plants that form moſs-earth are but partially introduced. Along with the heather (*Erica vulgaris et tetralix*), the yellow fogs (*hypnum ſquarroſum, filicinum et rutabulum*), goldilock (*polytrichon commune*), ſtoolbent (*juncus ſquarroſus*), whitebent (*nardus ſtricta*), tormentilla, &c. which contribute to the formation of moſs-earth, ſeveral of the ſedge graſſes (*carices*), and even ſome of the richer graſſes, as bents (*agroſtes*), feſcue (*feſtuca*), hoſe graſs (*holcus lanatus*), &c. grow in a dwarfiſh ſtate; and the accumulation of moſs-earth is ſo ſlow, that, even in places neglected as to culture ſince the commencement of vegetation, moſs-earth has only attained to a few inches in thickneſs, and is not fit for fuel, but is merely a black, friable mould, formed over the original ſoil. This ſpecies of moſs-earth I ſhall have occaſion to notice, in courſe, under the denomination of moor-ground, or *hill-moſs*.

Where the ſurface has leſs declivity, and the ſubſoil of a clayey nature, through which the moiſture does not ſo readily percolate, the ſtoolbent (*juncus ſquarroſus*), turfy club-ruſh (*ſcirpus cæſpitoſus*), goldilock (*polytrichon commune*), ſedge graſſes (*carices*), blue mountain or blowing graſs (*melica cærulea*), tormentilla, yellow fogs (*hypna*), &c. are the moſt prevalent plants; and there, moſs-earth will be found to have accumulated from one to three feet in thickneſs; to be more firm and ſolid than any other ſpecies of moſs; and to make the beſt fuel. This, in the weſtern parts of Scotland, is uſually denominated *bent-moſs*; and I ſhall give it no other name.

But

But where, from the surface being still more level, and the subsoil close and impenetrable to water, and where, by the rising of springs, overthrow of trees, or other obstructions, a still larger quantity of moisture has been long detained, and continues to be constantly kept on the surface, every thing in the shape of grass or green herbage is banished; and the following plants grow up, viz.

Marsh fog,	Sphagnum palustre.
Goldilock,	Polytrichon commune.
Drab-coloured fog,	Bryum hypnoides.
Cotton heads,	Eriophorum polystachion, vaginatum et angustifolium.
Turfy club-rush,	Scirpus cæspitosus.
Yellow fogs,	Hypnum rutabulum et filicinum.
Heather,	Erica vulgaris et tetralix.

—and some smaller plants.

In such situations, moss-earth will be found from two or three to 50 feet in thickness; and where the supply of moisture on the surface is still more abundant, the depth of the stratum is fast increasing.

Moss of this description is always loose, open, light, and of a drab colour, the vegetable fibre being still perceptible; and, though it readily burns, makes but a weak fire. This, in all parts of Scotland, is denominated *Flow-moss*.

These three descriptions seem to comprehend all the arrangement, or classifications of moss-earth that are necessary, or can be of the least utility to the cultivator. All of them are abundantly perceptible; and, indeed, there is no other description of moss-earth that is not included in one or other of them. *Hill moss* is dry and firm, with a stratum of black earth of only a few inches deep; and, except the heaths, the plants it produces are stunted and dwarfish. *Bent moss* is distinguished from all others by its solidity and firmness, and the rough green herbage, resembling coarse grasses, with which it is uniformly covered. *Flow-moss* is in every respect different from either. It is nearly void of any thing resembling grass or green herbage: Heather and fogs are the chief plants. It is always wet, soft, frequently uneven on the surface, and sometimes abounds with hags, or natural gullies, of considerable depth.

None of these in the least resemble each other; nothing that I know is to be found in nature, which the simplest rustic could mistake for any one of them; each requiring a different mode of treatment, when improved for pasture or cropping.

By some learned Doctors who have written on this subject, moss earth has been divided and subdivided into many different species;

cies; distinguished from each other by their colour, density, inflammability, acidity, admixtures, supposed chemical qualities, &c. &c. To these they invent a nomenclature, extremely perplexing, in which no two of them agree; and they tell us, 'that it is clear to a demonstration, that these *different genera* must require *different treatment*, either as a soil 'or manure;' that 'it were equally absurd to cultivate all these 'different kinds of moss in the same way, as to apply *one plaster to all sores.*' In fact it would seem, they think nobody can cultivate moss with success, or with certainty, until they have ascertained not only the plants on its surface; the degree of its solidity; its colour; how far the organic texture of the plants have been reduced; how many admixtures may have got into it; whether it has been transported by water, or by what other means it may have ben deposited; and until they have called to their aid some well-paced chemist, with the necessary apparatus, and made a complete analysis of the moss, to see if it is fit for fuel, manure, or a cultivated soil; and to say whether, from its nature and qualities, it must be manured with lime, dung, or what else. And as all these diversities of moss, according to their arrangements, may frequently be found, not only in the same field, but generally within a few yards of each other,—as, that of a dark and light colour—a dense or fibrous texture—this or that admixture or diversity of chemical qualities may be found above, below, and near to each other, in the same stratum; the whole moss would fall to be dug up, and a new analysis made, wherever the colour, solidity, &c. were found to vary, before the humble cultivator could with safety proceed to labour or crop any part of it. When it is considered, however, that none, even of these learned Doctors themselves, have yet been able to make a proper analysis of any moss; that such operations are tedious, laborious, and very expensive; and that, in the still imperfect state of science, the results cannot always be depended upon; these distinctions, which, in so far as regards the cultivation of moss, seem to be fanciful, unnecessary and unintelligible, instead of promoting, cannot fail greatly to retard, the improvement of that species of soil,—intimidate and bewilder the cultivator,—and deter him from so much as attempting to reclaim any part of these unsightly wastes. Like the road which some have pointed out to heaven, these learned gentlemen mark off so many turnings and windings, styles and traps, the least deviation from any one of which will be for ever fatal, that the farmer, when he has read their learned theories, will abandon moss culture as a foolish and dangerous project.

An ingenious, intelligent, and highly respectable author (Dr Rennie),

Rennie), has in p. 617 of his Essays on Moss, objected to the arrangement made in my publications, and which is the same as here stated, as deficient and indefinite; and after reducing the plants I had mentioned to the form of a table, he adds, 'According to this table, hill moss contains all the plants which 'grow on the other two kinds, except three. The first four 'plants are common to the first and third species; the next 'eight are common to the first and second. To suppose, there-'fore, that this *small* difference should constitute a ground of ar-'rangement, either intelligible to the natural historian, or useful 'to the cultivator, appears doubtful.'

But if the Doctor had duly attended to what I stated on that subject, he would have found, that, though I gave a list of the plants which each of these sorts of moss produces, I did not classify moss according to the vegetables which grow on the surface. I say, in page 11th of the pamphlet he quotes, 'The only rational and useful classification of moss-earth, seems 'to be that which arises from the aspect it presents to the culti-'vator.' The diversity of the plants that grow on hill-bent, or flow-moss, are not so great as Dr Rennie seems to have expected. Heather, the most bulky of all the moss plants, is found on hill and flow-moss, but scarcely ever met with on bent-moss. The yellow fogs (hypna) abound on all sorts of moss, and every other soil; the goldilock grows on all kinds of moss, and upon every kind of moorish land in all parts of Scotland,—on the dry sands at the sea-side, the tops of stone-dikes, and the wettest stanks in flow-moss. In dry places, however, it is but short and dwarfish; in moss gutters, it grows long and luxuriant. The sphagnum palustre, bryum hypnoides, and cotton heads, never grow but in very damp places, either on flow-mosses, or where that species of moss is beginning to be formed.

But whatever similarity there be in the plants that grow on their surface, the *general aspect* of these three species of moss are so very different from each other, that no man who can point out one species of soil from another, could have the least difficulty in distinguishing them. A piece of hard, dry, heathy ground, on the skirts of a hill, having a firm open bottom, with heath and stunted dwarfish herbage, and only a few inches of black earthy mould, has no resemblance to solid firm moss, two or three feet in depth, forming the best fuel, and covered with coarse green herbage, eaten by all sorts of cattle; and still less resemblance to a deep soft flow-moss, which does not support the foot of a man, scarcely of a dog,—on which no green herbage appears, and which is intersected with deep hags. There is no other species of moss that bears the least resemblance to any of them:

them: And though they are found lying in alternate patches, and, like the other productions of nature, do not change abruptly, but gradually, and almost imperceptibly; yet they are all so different in their general appearance, that when they are only named, every labourer will point them out. It is not necessary to bring men conversant in science, with re-agents, or chemical apparatus, to point out the distinctions; for they are so obvious, that he who runs may read.

I am not, however, to be understood as despising science. On the contrary, I have taken every opportunity in my power, to show the intimate connexion that subsists between chemistry, natural history, and agriculture; and to express my wishes, that something of the rudimental parts of these sciences were taught in all our churches and parochial schools. I have lamented, that the qualities of moss-earth have not been better ascertained, by men of science. The researches of Lord Meadowbank, who is an adept in science and in agriculture, has led to the most useful results, in converting moss into manure; and I trust still greater discoveries will be made. But I expect no good from a divided and subdivided classification, and greatly extended nomenclature of moss. This can only serve to perplex the cultivator,—deter him from proceeding to reclaim his mosses, and mar the usefulness of publications that otherwise might do much good.

II. *On the Qualities of Moss.*

It would certainly be desireable to scientific men, and might lead to some useful results in agriculture, if a more complete knowledge were attained of the qualities of moss. The natural historian would no doubt be profited by further knowledge of the essential qualities of substances, of which the plants, which form moss-earth, are composed; how these are collected, and united into plants by vegetable organization; what are the chemical principles to be found in these plants, either when in the vigour of their growth, or when partial or more complete putrefaction has taken place. Such information would no doubt lead to useful results in natural history, in chemisty, and in agriculture. It would probably discover more perfect and easy modes of overcoming the antiseptic qualities of moss-earth, and thereby render it still more efficient as manure; and perhaps show what substances operate most powerfully as manure to a moss soil.

Till such information can be procured, we must content ourselves with that portion of knowledge to which we have already attained, and to which we are daily adding, by well-conducted experiments. To retail the partial experiments, or attempts, at analysis

analysis of that substance, which have been already laid before the public, and in the technical form in which they are generally given, could be of no use to the great body of your readers, or to that valuable class of men, the practical farmers, to whom we are to look for the improvement of our extensive wastes. All that I shall attempt, and indeed all that in my opinion can be useful to the cultivators of that species of soil, is merely to name the qualities that are most perceptible to an agriculturist; as, *inflammability—acidity—insolubility*, or *antiseptic quality—tenacity*, &c.

1. *Inflammability*, or the quality of catching and being consumed by fire, which is found in all sorts of completely formed moss-earth, no doubt proceeds from one or other of those substances which chemists term simple inflammables; as carbon, sulphur and phosphorus, with the binary compounds into which they enter.

To which of these the inflammability of moss-earth is to be chiefly imputed, has not probably been well ascertained; and as the fact, of its being highly inflammable, is well known to all ranks; and as further inquiries regarding that quality are no way connected with its improvement as a cultivated soil, it can serve no end to dwell on it here, were I even better qualified than I am to do justice to the subject.

The plants which contribute to the formation of moss-earth, possess, when growing, no more inflammability than recent vegetables of any other description. But, while the inflammability of other vegetables is diminished in proportion as putrefaction and decomposition advance, the plants which compose moss-earth, kept together in a mass, become more inflammable, in proportion as they have come under putrefaction, and a dissolution of the organic texture. How nature conducts these processes, so different in the putrefaction of different kinds of plants, has not, I believe, been yet ascertained, though the fact cannot be doubted. As there seems to be no material difference in the degree of inflammability in all the kinds of plants, at the time they attain full growth, either the moss plants must, by some process in nature different from those of other species, retain all their inflammability when under putrefaction, and only yield up the ingredients of a different nature; while other plants first give up with that quality, and retain those that are uninflammable; or the former must attract and acquire inflammability, as putrefaction advances, while the latter have no such powers. Dr Rennie thinks the inflammability of moss arises from its *retaining*, while under decomposition, a large portion of *hydrogen*. But Dr Jamieson says, that many facts lead him to conclude, that the common peat is vegetable matter, *deprived* of a considerable portion of its

hydrogen. Moss earth, however, soon loses much of its inflammability when it is dug up, and long exposed, separately from the general mass, to alternate rains, droughts, frosts, thaws, &c.; but, if dried when recently dug up, and kept dry, it will bear to be exposed to the air for centuries, without losing any part of its inflammability.

I cannot concur in the opinion of Dr Rennie, p. 507 of his Ess. that 'moss is more inflammable in proportion to the moisture it contains.' The reverse seems to me to be uniformly the case. The more level that moss is, and the more moisture it is laid under, the less valuable will it be as pasture, as a cultivated soil, as manure to other land, or as fuel. If the water is raised two or three feet over the surface, none of the plants that have been named above can grow. Lake plants, as the *Potamogeton natans, Nymphæa lutea et alba, Arundo phragmites, Scirpus lacustris, Alisma plantago, Pedicularis palustris,* &c. are the ordinary plants that grow, till they accumulate in and fill up the lake to the surface. These form, not properly moss, but a sort of lake turf, scarcely inflammable, or fit for fuel. If the surface is not covered with water, but kept extremely wet, the *Sphagnum palustre, Polytrichon commune,* and *Bryum hypnoides,* will be the chief herbage. These form a sort of light, fibrous, drab-coloured moss, that, when dry, will catch fire and burn; but which is the least inflammable of all sorts of peat, and scarcely deserves the name of fuel. From that state to the driest moss that is to be met with, the degree of inflammability is gradually increased. Hill moss is too thin for being cut up for peat; but bent moss, which has always as much declivity as prevents water stagnating on the surface, forms the best of all peat. One square foot of the driest of bent-moss, will go farther as fuel, than ten foot of the drab-coloured peat composed of sphagnum, and which has been formed in a stank of water. In a word, moss-earth is inflammable, and valuable as fuel, just in proportion as it has been relieved of stagnant water.

The trees that are found buried in moss, are not inflammable in proportion to the progress that putrefaction has made upon them, as some have asserted, but the reverse. The rotten birch trees, and those parts of the oaks that are most completely dissolved, will kindle and burn; but they do not make nearly so good fuel as the firs, and the more solid parts of the oaks, that have not yielded so much to putrefaction.

2. *Acidity* in moss is evidenced by its smell when newly dug; by the pungent acrid odour of peat smoke; the smell of clothes, or any thing that has remained long in a house where peats are used as fuel; the pain felt in their eyes by people going among

the smoke of peats, who are not accustomed to breathe in such an atmosphere. Some have termed it the *gallic* acid, some the *suberic*; and others have mentioned the *carbonic*, the *acetic*, and the *sulphuric acids*, as abounding in moss-earth, &c. But, as Dr Rennie justly observes, though the acidity of moss is abundantly obvious, the particular acid found in it has not yet been sufficiently ascertained; and probably different acids may be traced in different mosses.

All that seems necessary for the husbandman to know, is, that moss contains a considerable portion of some acid or other. Whichever of the kinds it may be, lime will neutralize it, and convert it into manure; and the destruction of the acid by lime, will accelerate the decomposition of the vegetable matter of which the whole mass of moss-earth is composed; and, as putrefaction advances, the food of plants will be prepared, and the moss will be gradually formed into a black mould. Lime is the best reagent that the farmer can apply; and a shovel to put it on, with a spade to dig up the moss, are all the apparatus he can as yet use to advantage.

3. *Insolubility*, or an *antiseptic quality*, forms the distinguishing peculiarity of moss. All other plants, whenever they cease to grow, are liable to be dissolved by putrefaction. It is appointed for all vegetables, as well as animals, to die, and, after death, to be subjected to decomposition. That terrible power begins where vegetation terminates; and steadily pursues its course of destruction, till it completely reduces the beautiful works of vegetable organization, sets the whole substances of which plants were composed at liberty, and either restores them to the elements from which they had been collected by vegetable organization, or gives them an opportunity to enter into new compounds. While vegetation is rearing and perfecting a new crop of plants, putrefaction is reducing and separating the component parts of that which preceded it; and as growing plants are fed upon the remains of former crops, when reduced by putrefaction, that awful power may be considered as the feeder and supporter of plants while they remain in life, and their destroyer whenever they die.

The plants which grow upon, and contribute to the formation of moss-earth, are the only ones in the whole vegetable kingdom that oppose any thing like a successful resistance to the all-subduing powers of putrefaction. Their resistance, however, does not prevent the destroyer from advancing so far, as in all cases to disfigure the plants, and, in many cases, to nearly annihilate their organic texture; but its powers are not adequate to the complete reduction of that tribe of plants. A considerable por-

tion of the organic texture of some of the plants, and a sort of mucus which is formed of others, baffles the powers of putrefaction; and one crop of these accumulating over another, the moss stratum has risen to the height we now see. The plants that grow in the greatest quantity of moisture, are those that present the most powerful resistance to putrefaction.

The insoluble antiseptic qualities of moss are so powerful, that they will prevent putrefaction from making the least progress on wood, metals, clothes, leather, or even on animal matter, when buried in moss. The trees found in moss are often much rotted, especially in the upper side; but this must have happened before they were covered over by the moss. The clothes on dead bodies buried in moss for more than a century, have been found as sound and free from rottenness, as if they had only remained there for one month. I have in my custody a shoe, evidently of Roman manufacture, and a species of cloth formed of hair, both found under moss in this parish, which, though they must have remained there for many centuries, are as free from corruption as those now in the shops for sale. Many human bodies have been dug up from under moss, in various parts of Britain and Ireland, after remaining a century, and some of them several centuries in the moss; all of which have been found as entire and free from corruption as when they were buried.

So far as I know, it has not yet been ascertained what are the particular ingredients in these plants, or in the moss-earth formed from them, that withstand the powers of putrefaction. Dr Walker thinks it cannot proceed from the mineral or vegetable acids; but Dr Rennie mentions the carbonic, the gallic, and the sulphuric acids, and Dr Jamieson the suberic acid, among the chief causes of the antiseptic quality of moss-earth.

Be that as it may, I am humbly of opinion that *tannin*, though not mentioned by either of them, contributes powerfully towards the resistance which moss presents to the dissolving powers of putrefaction. Many of the plants which grow upon moss, and contribute to its formation, contain a large portion of *tan*. Tormentilla, which is found growing in all sorts of moss, contains more *tan* than any other plant, and is the most powerful astringent known in the vegetable kingdom. Probably resin, gum extract, and the bitter principle, will also be found in some of these plants, and contribute to their antiseptic qualities.

As moss is wholly composed of vegetable matter, and, of course, would form the best of manure, if it were or could be rendered soluble, a discovery of the means by which its antiseptic and insoluble qualities could be removed, and the moss rendered

dered as septic and soluble as other vegetable matter, would be of greater importance than any discovery, either in agriculture, or any other science, for a century past. It would, in fact, enable the farmer to extend the volume of his dunghill at pleasure, and add several millions of acres to the range of cultivated and productive soil.

4. *The tenacity* of moss, in the natural mass in which it is found, and when it has been dried into peat, has been noticed by all who have written on the subject. While moss remains unbroken, it is so close and adhesive, that, if left one or two inches in thickness, and duly supported, it will hold water like a dish; and when good black, well decayed moss, is cut into peat, and dried, before its tenacity is loosened by frost, or much rain, it becomes so hard and firm, that it is not afterwards so easily formed into a soil, or melted down by the weather. But this quality in moss seems to me to have been much overrated.

Degner, a Dutch philosopher, author of the opinion afterwards retailed by Dr Anderson, viz. that moss was a growing plant *sui generis*, asserts, that when moss is dried, it becomes a hard tenacious substance, insoluble in water; and that his countrymen sometimes lay the foundations of their houses on peats; and when the buildings have decayed through age, the peats remain sound. Dr Anderson, who implicitly follows Degner, repeats the same story; and Dr Rennie, who has devoted a section to that subject, asserts, that 'after peat is thoroughly dried, it is one of the most insoluble substances, and the least liable to change or dissolution.' He then adds, under a quotation mark, but does not say from what authority, that 'a piece of dried peat was put into the boiler of a steam-engine for three months; yet, though exposed to a heat greater than boiling water, it remained unchanged.' The surface of the peat was covered with something like the powder of iron; but 'the centre, and all but the surface, was unchanged.' This tenacity, the Doctor thinks, proceeds from the bituminous qualities of the moss; and he says the adhesion of the peat can be destroyed by removal of the bitumen, and again restored by the 'application of liquid bitumen, or even by immersing it in a quantity of water squeezed out of another piece of moss.'

I have never seen peats that had remained for ages as the foundation of a house, nor that had been three months in a boiler; but I have seen peats of as good quality as the best in Holland, or any other place, when exposed to the vicissitudes of the weather for three or four years, lose their tenacity, become loose and friable, and moulder into earth, being as destitute of inflammability as so much old farm-yard

dung. The ends of those that are in a stack exposed to the weather for a year or two, become loose in their texture, and lose the greatest part of their inflammability. Vegetables will soon begin to grow in them; and the whole stack would crumble down to earth, in a shorter time than a well built house in Holland could be supposed to decay of age. The ends of the peats that are placed next the ground in the stack, are always damp, and their adhesion loosened; and peats are always so, when placed for a few months in any damp place. When any, even of the driest and the best peats that ever were cut, are left on the spread-field over year, they are not worth taking home for fuel next season; and in two or three years more they have lost all form of peats and adhesion, and are crumbled into earth, nearly destitute of inflammability. I never tried the cementing powers of any other liquid bitumen; but the water squeezed out of any other species of moss had no effect with me in restoring the tenacity of weather-beaten peat. I will venture to assert, that all the juices that can be squeezed out of an acre of moss-earth, will not cement and render adhesive one peat of an ordinary size, made up of the remains of those that had remained two years exposed to the weather, or of the crumbs of peats on the peatstack-stead. If these were again reduced to pulpy mucus, or as soft and void of granulated matter, (a thing by no means easy to be done with good peat), it might be baked into peat, which would be somewhat adhesive when dry; but I do not suppose that the water squeezed out of moss would have any effects in that operation, more than that taken from a spring or river.

Degner and Dr Anderson have endeavoured to support their favourite theory, by an argument deduced from the circumstance, that no worms, nor animalcula, are found in solid unbroken moss, more than a foot or eighteen inches below the surface. Dr Rennie, taking their story for his text, has displayed much ingenuity and knowledge of science, to show that the want of reptiles in moss is a proof of some peculiarly noxious quality in that earth. And in page 564, he says, that no species of fish do exist in liquid moss; and neither fishes, nor any living creature, can be detected in moss water, if stagnant and unmixed.

But, with due submission to authors of superior erudition, I can discover no mystery in the want of worms and reptiles in solid unbroken moss below the soil. If I understand reptile economy, they are never found beyond the bounds of the soil, or the reach of the moisture that passes from it, and is impregnated with vegetable matter. Worms, and all sorts of animalcula, live upon the vegetable matter in the soil that has come under fermentation. It is in such situations that they are found; and it is upon

upon that which they live. In unbroken moſs, there is ſcarcely ſuch a thing as a ſoil. There is little or no fermentation or decompoſition of vegetable matter, even on the ſurface of unbroken moſs, which is cloſe and ſolid, and where the vegetable matter is inſoluble and antiſeptic; and, there being no food for them, the animalcula are not found there. Neither is the mole found in ſuch moſs. That creature lives on the animalcula, as they do on the vegetable matter when under putrefaction. That being awanting in moſs, there are no animalcula, and as few moles. But whenever the moſs is dug up, and fermentation and decompoſition brought on the vegetable matter by the acid of manure, expoſure to the atmoſphere, or other means, armies of worms and animalcula are raiſed, and troops of moles are found in chaſe of them.

Dr Rennie ſays—'Certainly living animals may be detected much deeper in other ſoils than in moſs.' The Doctor is certainly correct in that aſſertion; and the reaſon is obvious. Other ſoils are generally more open and permeable than ſolid unbroken moſs. The herbage that grows on them is not of an antiſeptic quality, like that on moſs; but, whenever it ceaſes to grow, it yields to complete diſſolution by putrefaction. The vegetable matter ſo diſſolved forms and enriches the ſoil; and the vegetable juices are waſhed in, and ſink into the earth to a conſiderable depth, according to the permeable nature of the ground; and, wherever theſe go, the animalcula will be found. But, in moſs, there is no ſuch thing as vegetable matter under putrefaction. If it were, the cloſe texture of that earth would prevent it from ſinking even a few inches; of courſe, there can be no worms nor animalcula there. The want of them does not proceed from any noxious quality in the moſs pernicious to animal life.

Fiſhes, and every ſort of living creatures that occupy ſtanks and ſmall ſtreams where there are no moſs water, are found in thoſe which are entirely compoſed of that ſpecies of water. There are hundreds of burns, rills, and ſtanding lakes or pools of water, in all the counties in Scotland, ſituated in the middle of deep moſs, and into which nothing but moſs water can ever fall; and yet theſe ſtreams, pools or ſtanks, are ſtored with various ſorts of fiſh, and all the living creatures that occupy places where there is no moſs. The *Blackburn*, pariſh of Crawfordjohn, riſes in, and runs through moſs; is compoſed of moſs-water, and nothing but moſs-water, dark and brown; yet it yields the largeſt, the beſt, and the greateſt number of trouts that are to be found in any ſtream of the ſame ſize in Scotland. The lochs, ſtreams and ſtanks, that abound at the head of Loch-Dunn in Ayrſhire,

are entirely compoſed of moſs-water; yet fiſhes, and many living creatures, abound in all of them.

I did not intend, when I began to write, to have occupied ſo much of your valuable room on *this part* of the ſubject; but an ardent wiſh to render every thing regarding that ſubſtance clear to the ſimpleſt cultivator, and to remove objections that ſeemed to ſtand in his way, has carried me further than I intended to have gone.

III. *The Uses of Moss-Earth,*

Are, 1. *Fuel*; 2. *Pasture*; 3. *Plantation*; 4. a *Cultivated* Soil; and, 5. *Manure*. I ſhall offer a few remarks on each of theſe in their order.

1. Moss is, next to coal or wood, the beſt fuel yet diſcovered. Where either of the former can be obtained, it will ſeldom be uſed; but where theſe are not plenty, or far diſtant, peat is the beſt ſubſtitute.

The mode of cutting and drying peats is ſo well known to every labourer in all parts of Scotland, that it would be treſpaſſing upon your patience to ſpend time in deſcribing it. Except in ſome parts of Galloway, where moſs fit for fuel is ſcarce, the mode of baking peats, ſo common in Ireland, is not known in Scotland. The ſuperior quality of the peat, however, in ſome meaſure indemnifies the additional labour.

The greateſt improvement that I could ſuggeſt in the management of peats, would be to erect ſhades to keep them in during winter. When ſet up in the ordinary way, in ſtacks, altogether without cover, every heavy ſhower renders them unfit for a time to be uſed as fuel. When a courſe of rainy weather happens, it becomes extremely difficult to get the cookery for the family carried on with peats; while the ſmoke which they emit, fills and darkens the houſe in which they are burnt; and every time that peats are wetted and dried, their adheſive texture is ſo much looſened, and their inflammability, and durability as fuel, diminiſhed.

A ſhade to hold peats for one year, might be formed of the cupples of an old houſe, or other old timber, which is frequently left to rot, and thatched with heather, broom, or ruſhes, in the time that the farmer and his ſervants ſpend at races, fairs, roups, &c. where they have no intereſting buſineſs; or in the time they are employed building the peats into a ſtack. It ought to be ſo conſtructed, as to admit a current of air to paſs through the ſhade.

2. Moss-ground is uſed as paſture, chiefly for ſheep ſtock. The improvement that ſeems practicable on this ſpecies of paſture is, to adjuſt the quantity of moiſture, and to provide ſhelter for the ſtock.

By far the greateſt part of the ſheep-walks in Scotland, compoſed

posed of moss, are greatly injured by being overcharged with moisture, which banishes the valuable grasses, and raises the moss fogs; and the sheep are much hurt, and frequently drowned in the gutters. To remedy these evils, the whole moss ground ought to be surface-drained. The mode of doing so with spades is well known. Perhaps some part of it might, in favourable situations, be executed by the plough.

By opening surface-drains where necessary, the value of the pasture may frequently be more than doubled,—the growth of flow-moss retarded,—the moss consolidated and prepared for more improved culture,—the climate bettered, and the condition of the stock greatly meliorated. I know no improvement by which so much good could be done, at so small expense, and with as much certainty of being refunded. In many cases, the pasture could be surface-drained by the shepherds, in the course of a few years, without interfering with their duty to their flocks. But the indolent habits of the pastoral life are not easily overcome: the herds continue to loiter, half idle, on the hills, and the sheep to wade in the gutters as formerly.

In some situations, large tracts of sheep pasture and moss ground could be much improved, by turning streams or rills of water over it. Earth, sand, mud, &c. might frequently be thrown upon such pasture by means of a mountain rill, that is neglected, or suffered to do much injury. I saw an improvement of that nature, executed by the Bishop of Llandaff, whereby he had reclaimed a few acres of moss, of the least value, near Colgarth House, on the side of the Windermere Lake, and converted it into pasture, which grazed a large milk cow on each acre, formerly not worth one shilling. If every acre in Scotland, capable of being reclaimed in that way, were brought to as great perfection, the profit of the occupier, the proprietor and the public, would be beyond calculation.

When I surveyed the county of Ayr, I was much pleased with an improvement of that nature, executed by J. Cochran esq. of Ladylands, on some high land of his, near to the head of the Garnock. By turning a rill from the hills, over a piece of bleak ground, which produced little herbage but white bent *(nardus stricta)*, stool bent *(juncus squarrosus)*, with yellow fogs *(hypna)*, and some grasses of a dwarfish size, he was enabled, two years after, to cut 4500 stones English of good hay from 11 acres, formerly not worth in all 2*l.* Sterling of rent. Like other improvements, it only excited laughter and clamour among the country people; but now that it has succeeded so well, I trust they will follow his example. Many thousands of acres might be improved in that way in Scotland, so as to yield 50 or 100, perhaps 500 per cent. on the expense incurred.

3. Plantations may be raised to great advantage, and with much success, on a moss soil. I have seen many different kinds of forest trees growing with great luxuriance on mosses of considerable depth, in almost every county of Scotland, and in all the counties of England in which I found moss. Not only birch, mountain ash, saughs of various kinds, alders, and other aquatics, but firs, larches, spruce, limes, beeches, elms, and oaks, grow well on mosses of great depth; and all of them, with several other kinds of trees, may be seen in many deep mosses.

When plantations of any kind are to be raised on moss, it is necessary not only to relieve the surface of moisture, but, if the moss is deep, and has little declivity, ditches also ought to be cut, three or four feet deep, at the distance of 50 or 60 feet, at most, from each other. The moss-earth taken from the ditches should be laid into hollow parts of the intermediate ridges, which should be smoothed, and raised in the centre, that the rain-water may run speedily into the ditches; and these ought to communicate with the principal drains, so that no water may remain in the ditches. If the ditches are properly formed, and kept clear, and the surface of the ridges to be planted kept smooth, and free from stagnant water, planting will grow well, and turn to good account, in any kind of moss not more than 1000 feet above the level of the sea. Even in greater altitudes, trees can be raised, in convenient spots, to a sufficient height, for ornament to the country, and shelter to the sheep. What beauty would it give to the country, and melioration to the condition of moor stock, were a few clumps or belts of any kind of trees raised on the sheep-walks! A plantation to the extent of half an acre, may be enclosed with a dike of sod sufficient to turn cattle, and shelter the young trees, for 40*s.* or 3*l.* Thirty or forty such clumps might be raised over a sheep-walk for about 100*l.*, or less than one year's rent; while the shelter they would afford, and the beauty they would give to the aspect of the country, not to mention the value of the trees, would much more than compensate that trifling expense. It shows great want of taste to neglect an improvement so cheap, so necessary, so valuable, and tending so much to ornament the face of those dreary regions.

4. Moss may also be used as a cultivated soil, for the raising of grain crops. Until of late, the proprietors and possessors of moss-land were ignorant of its value as a cultivated soil, and contented themselves with the pasture it yielded, and the *game* it produced. Those who first talked of raising grain, or roots, from moss, were held up to derision; and to this day moss culture is laughed at, and considered as a whim, even by the generality of farmers. Fortunately however for mankind, and particularly for Britons, it has been ascertained, beyond all doubt, that

that moss is as capable as any other soil of being reclaimed, and rendered productive of all sorts of grain, grasses, and useful roots. Convinced of these facts from my own experience, and from that of others, who for near 30 years past have raised the best crops from even the worst of mosses, I turned my attention to the subject with much ardour; and having travelled several thousand miles to see how these operations were conducted, I now beg leave to lay the result of all my studies and inquiries on that subject before the public, through the medium of your valuable Magazine, with the sincerest wishes that they may be reduced to practice, and that my countrymen may reap therefrom that benefit which I have the fullest conviction it is capable of yielding.

1. When the cultivation of *hill moss* is attempted, all that is necessary is, to reduce the land to a proper form, apply manure, and adopt such a mode of cropping as that species of soil can admit of. In this kind of moss, the subsoil is the chief thing to be attended to. The incrustation of moss, or black mould approaching to moss, is seldom of sufficient depth to form a soil. The subsoil may be added to that of the moss; and the operations will fall to be regulated by the quality and condition of that subsoil. If it be clay, it would require to be ploughed and exposed to the weather, a year or two before it is cropped; if sand or gravel, as is most frequently the case, it will fall to be treated like other new or poor land of that description. This subsoil will, like all other newly broken up ground, be almost void of vegetable matter: that on the surface is sufficient to supply the defect; but, being insoluble, it would need to be reduced by caustic lime, or other stimulants, which tend to accelerate the decomposition of moss-earth. If the soil is sandy, too much exposure to the summer drought, would tend to render the moss-earth still more insoluble, and could do no good to the sand. After one or two crops, it ought to be laid down with grass-seeds, and pastured for three or four years. Potatoes and turnips are proper crops for such land. These may be followed by barley or oats, with grass-seeds. Green crops would, by overshadowing the ground, bring the original moss-earth in the soil into a state of greater solubility, and accelerate its decomposition.

I am yours, &c. W. Ayton.

[To be continued.]

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Culture of Turnips.

Sir,

From a consciousness that in agriculture, as well as in every other art or science, one well authenticated fact is worth a thousand

ſand theories, I have reſolved to lay before you the reſult of a ſmall experiment which I tried in the cultivation of turnips; hoping it may be uſeful to ſome individuals in particular ſituations.

Nearly a ſtatute acre of fine rich ſoil was pared and burnt, in June 1809. The plough and harrow almoſt immediately followed the ſpreading of the aſhes, and ſo far pulverized the ſurface, that I determined to drill in the ſeed upon the flat ground, (as, under exiſting circumſtances, ſtitches could not be thrown up). This operation was performed by one man with a ſmall *hand drill*, the wheels of which run 22 inches aſunder, with the ſeed-ſpout exactly in the middle. A ſtraight line was taken at the beginning; after which, the marks of the wheels and ſeed-ſpout were ſufficient guides; and the man walked to and fro till the whole was ſown in rows, 11 inches aſunder; and then a roller finiſhed the proceſs.

The richneſs, and apparent fitneſs of the ſoil for turnips, produced a belief, that it would mature as many plants as could ſtand upon it; and this induced a further trial of the ſame plan upon about half an acre of the ſame field, that had been cultivated as a kitchen garden for three or four years. The plants in both plots came up with beautiful regularity; they had due attention paid to keeping them clean by the hand-hoe; were properly thinned in the rows; and ultimately produced a very good crop indeed. The produce of the burnt land was ſold to a retailer, at the rate of 20l. per acre; and my own man retailed the other, at the rate of about 30l. per acre, for *table use*.

In another field, of nearly the ſame kind of ſoil, the ſward of which had been broken, and a crop of oats taken off it the preceding year, I tried near 4 acres more upon the ſame principle; but the rows were about 3 inches wider. The produce was ſo great, that although turnips were not dear in our neighbourhood that year, they ſold readily to *cowkeepers* for 18l. per acre. The 4 acres were of the globe, the two ſmaller patches of the Norfolk white turnip.

The foregoing method of cultivating turnips, probably could not with propriety be generally attempted; but if you think this little eſſay worth a place in your very uſeful publication, your readers may conſider how far the adoption of it may ſuit their local and particular ſituations.

Biſhop Wearmouth, County of Durham. W.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Case of the Sons of the late Mr Small, Inventor of the Improved Plough.

SIR,

IT may be ſuperfluous in me to inform you of the general ſatisfaction occaſioned by rewarding the almoſt neglected merit of Mr Andrew

Andrew Meikle, to whom the agricultural intereſt of this country is ſo much indebted. But, at the ſame time, it is matter of regret, that Mr James Small, who made ſuch an important improvement upon the plough, by inventing the Caſt Iron Mould-Board, &c. which occaſioned ſuch a ſaving, and ſuch an improvement upon that implement, ſhould have escaped all notice whatever. He, however, left two ſons of his profeſſion (who at present reſide in Leith-Walk), in a ſituation peculiar to men of genius. Indeed, beſides being at a great expenſe, their father's attention was for ſuch a conſiderable time devoted to the improvement of the plough, before he attained his end, that they were in very ſtraitened circumſtances at the time of his death, and are now become extremely embarraſſed. It is therefore ſincerely hoped, that it will not yet be too late to do ſomething for them, that will in ſome meaſure compenſate for the neglect shown to their father. It may be ſaid, that our exiſtence depends upon agriculture;—the promoters of which, are certainly, of all perſons, the moſt deſerving objects of reward.

You are no doubt well aware of the treatment which Mr Small met with from the Carron Company. But, as his improved Mould-Board muſt be a great object, not only to them, but alſo to the other foundries in this country, it is not doubted that they will be happy to have an opportunity of ſhowing their gratitude to the ſons of the man who, when in life, was ſo much neglected.

Whatever may be your opinion of the preſent communication, it is not doubted that the bare mention of the name of Mr Small will excite your attention.

26th June, 1811. P. F.

NOTE.

The Conductor of the Magazine, quite ſenſible of the great improvement made by the deceaſed Mr Small upon that important implement the Plough, is well diſpoſed to promote any ſubſcription for the benefit of his family. Therefore, ſhould ſuch a ſubſcription be brought forward, Mr P. F. may be aſſured that every aſſiſtance ſhall be given to it by the Conductor and his friends.

N.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Smut in Wheat.

SIR,

THOUGH an entire ſtranger, I conſider it would be improper to take up your valuable time with a long introduction. Suffice it to ſay, that I am a farmer in a carſe ſoil, where much wheat is raiſed; and though unaccuſtomed to commit my thoughts to paper, am diſpoſed

diſpoſed to try my hand at preſent, and riſk a few conjectures on the cauſe of ſmut in wheat; which, if you think worthy of inſertion in the Farmer's Magazine, I may at ſome future period make another attempt. Meantime, I beg of you to regard this as my firſt one.

In order to arrange my thoughts a little, I ſhall, firſt, mention ſome caſes wherein ſmut has followed; next, mention various plans adopted by farmers to prevent it; and, from comparing theſe, *riſk a conjecture of the cauſe*, with the probable way in which it operates.

Before entering upon theſe, I may premiſe, that ſmut is not peculiar to wheat, but is often found in barley and oats, and, of the latter, particularly in the potatoe and other early varieties. But when theſe are affected with it, the weather, or the thraſhing, ſo diſperses it, as never materially to damage the grain; on which account, farmers have taken little or no pains to prevent it. In wheat, however, ſmut, when in any conſiderable quantity, not only decreaſes the quantity, but likewiſe damages the otherwiſe pure grain, to the great loſs of the farmer and the community.

Having premiſed theſe things, I proceed to mention a variety of caſes which have been followed by ſmut.

1ſt, When ſeed of the growth of the preceding crop, in a damp harveſt,—or which has been houſed, ſtacked, or thraſhed, when in a damp ſtate,—has been uſed.

2d, When the ſeed has been previouſly kept long upon a loft, or carried on ſhipboard.

3d, When the ſeed has been ſown on land ſtrongly manured with dung not ſufficiently decompoſed; or upon land in a warm ſituation, with little circulation of air; or, finally, upon land that was cloddy and dry at the time of ſowing, eſpecially if it continued deficient in moiſture ſome time after.

In every inſtance which has come under my obſervation, when a crop of wheat has been ſmutted, it has been under one or other of theſe caſes. I next proceed to mention ſome of the more common means uſed to prevent this evil.

1ſt, Steeping the ſeed, for ſome hours previous to ſowing it, in a pickle of ſalt and water, made ſo ſtrong as to ſwim an egg.

2d, Moiſtening the ſeed, immediately before ſowing it, with human urine; and duſting it over with ſlack lime.

3d, Kiln-drying the ſeed; and afterwards putting it through the fanners, to take any light grain out.

4th, Immerſing the ſeed in water, and ſkimming off whatever part of it will ſwim.

Beſides theſe, I have heard of mercury, a ley of wood-aſhes and quicklime, ſaltpetre, copperas, &c. &c. being uſed; but how applied,

applied, or with what ſucceſs, I have not learnt. The four modes I have mentioned, however, are of moſt general practice, and are ſufficient for my preſent purpoſe; and all have their peculiar advantages, though, in my opinion, not equally efficient.

Reflecting on the above-mentioned caſes, and comparing theſe with the methods uſed for preventing ſmut, I remark, that all the former are caſes in which mouldineſs is likely to be produced; and that all the latter are calculated to deſtroy it.

Mould is a plant of which there are many ſpecies, which any one may ſee, who will take the trouble to look under the word MUCOR, in the Encyclopædia Britannica; one of which is thus deſcribed. '6. The ſepticus, or yellow frothy mucor, is found 'on the leaves of plants, ſuch as ivy and beech, &c.; ſometimes 'upon dry ſticks, and frequently upon the tan or bark in hot-'houſes. It is of no certain ſize or figure, but of a fine yellow 'colour, and a ſubſtance reſembling, at firſt, cream beat up into 'froth. In the ſpace of 24 hours, it acquires a thin filmy coat, 'becomes dry, and full of a ſooty powder, adhering to downy 'threads. The ſeeds, under the microſcope, appear to be globu-'lar. Haller ranks it under a new genus, which he terms *Fuligo*; 'the characters of which are, that the plants contained under it 'are ſoft, and like butter at firſt, but ſoon change into a black 'ſooty powder.'

Comparing theſe circumſtances, and ſuſpecting that ſmut might be produced by mouldineſs in the ſeed, I had a handful of the beſt wheat put in a ſituation ſuited to produce mould, or mucor, on it. After I ſaw it covered with it, I had it ſown on clean clay land, where no crop ever grew. It vegetated, like other wheat; and the produce was moſtly ſmutted.

From the reſult of this experiment, I am led to believe, that ſmut, or black, in wheat, is the effect of mould, or mucor, on the ſeed. This will account for the partial affection of crops on the ſame field, which no theory I have yet ſeen has done. For inſtance, a few of the grains may be moulded in the ſtack, barn, bag, or on ſhipboard, and the reſt good; or (as is a common remark), that what is ſown on the head-lands, or the ridges on the outſide of the field, is more affected than what is ſown in the middle. This may be produced by the cloddineſs of the head-lands, occaſioned by the poaching of the horſes in turning; or want of a ſufficient quantity of moiſture, which is drawn off by ditches, hedges, &c. In either of theſe caſes, when the weather is dry, a ſtate of moiſture is formed, calculated to produce mouldineſs.

There is, however, another phenomenon in ſmut, which hitherto has not been accounted for in any ſatisfactory manner. It is well known, that ears on different ſtalks ſpringing from the ſame

root,

root, are not equally affected with smut; nay, even that some grains of the same ear are affected, while the rest are perfectly free. In endeavouring to account for this, we must advert to the exceeding minuteness of the seed of mucor, or mould, the form of which (according to the above quotation), even by the help of the microscope cannot be ascertained. Again, we must observe, that plants, as well as animals, are affected by the soil in which they live, and the food they receive; also, that the straw of grain has tubes, in which the nourishment ascends, to form and mature the grain. Keeping these things in view, let us suppose the seed deposited in the ground, and, either before or after, covered with mucor. When the young germ sprouts forth, at the same time the roots are sent out in quest of food. Their active mouths first meet with the seeds of the mucor, which they imbibe along with the fluids necessary for the nourishment of the plant and grain, and with them ascend to the extremities, where they expand, and generate their own species, which will be in proportion to the quantity of seeds thus inhaled.

I am aware, Sir, that by many this will be deemed chimerical. It may be so;—perhaps not:—But I must hold the opinion until I see one more plausible, which, if this paper has only the effect of producing, I shall not think all my pains lost. Before taking leave, however, I must remark, that if my supposition is right respecting mucor being the cause of smut, a dreary prospect is opened to many farmers this season, from the unprecedented drought in which most wheat was sown last season, which prevented much seed from vegetating for some weeks after.

Wishing your valuable publication much success, I am, Sir, your very humble servant,

Strath of Monteith, 2d March, 1811. A WHEAT GROWER.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Improvements on Sir Charles Edmondstone's Estate.

SIR,

I FELT much pleasure in reading the account of the improvements on the Duke of Buccleuch's estates, given by your correspondent W. B., as certainly the mode of letting land adopted by that Nobleman is an excellent one; which, as well as his method of furnishing houses and fences, deserves to be imitated by others. The attachment of his tenantry must be truly gratifying to such a benevolent Nobleman; though, with deference to his Grace, I believe the liberality of Sir Charles Edmondstone of Duntreath has been equally beneficial to the public. The estate of Kilpatrick was let a few months ago, not by the mode

mode of private offers, so much practised; but, after making a survey, a rent or valuation was made of the different farms, when the tenantry came forward in one day, and concluded agreements, one or two excepted; and the proprietor undertook to make such repairs on houses and fences as might be wanted.

The Honourable Baronet's procedure on the Kilsyth estate, is equally deserving of notice. That estate was forfeited in the year 1715, by Lord Kilsyth joining the rebel party; at which time, the tenants had mostly procured leases of three 19 years endurance, at a trifling rent. The estate was afterwards purchased from Government by Mr Campbell of Shawfield, who sold it to the Hon. Baronet's father. When Sir Charles succeeded to the estate, the old leases were not expired, and agriculture was most imperfectly exercised,—while the fences were miserable, and every thing upon the farms made a poor appearance. However, the leases ending mostly at one time, this enabled the Hon. Gentleman to grant new leases, of 19 years endurance, in which every encouragement was given to enterprising tenants. New farm-steadings were built over the whole estate, affording excellent accommodation to the farmer, his family, his servants and his live-stock. Water-courses were straighted, deepened and widened; old fences, where there were any, were entirely torn up; and the whole estate enclosed and subdivided in an excellent manner, partly with stone walls, and the remainder with hedge-rows, which were to be trained, for the first five years, at the sole expense of the proprietor, who also furnished proper gates for every enclosure. When I say that all I have mentioned was done without any per centage whatever being required from the tenantry, such an instance of liberality will scarcely be found in the island; though I must add, that, in some cases, the tenant was required to work a day or two with his horses, to forward the building of houses or fences; but he was paid for it at the ordinary rate of the country. I may also mention another instance of liberal conduct to one of the tenants who was the most forward with his improvements, and possessed a farm of 300 acres, which he had completely drained, and levelled and straighted the ridges. Indeed, all these operations were done in an excellent manner, and at a great expense.—I say, when this was done, he got five years more added to his lease, without any advance of rent; and likewise, many other favours were granted to the rest of the tenants, such as making roads and building bridges, digging pump-wells, and, in some cases, clearing whinny land, and draining bogs, &c.; and, to say no more, the emulation betwixt the tenants, who to be first through with his improvements, is truly meritorious and praiseworthy. There are numerous clumps of planting, and other ornamental work, going forward on the estate, which

which will in a few years present an agreeable prospect, and give the country around a most flourishing appearance. Should you deem this worthy of a place in your valuable Magazine, it will oblige, yours, &c. B. A.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Professor Davey's Recommendation of Mr Greg's System of Agriculture.

SIR,

WHEN perusing your last Number, my attention was called to the short article, page 262, adverting to the lectures of Professor Davey. The doctrine animadverted on in that article is a dangerous one, could it really have many *voluntary* followers;—I mean, the entire condemnation of summer-fallow by Dr Davey, and the recommendation of Mr Greg's system in its stead.

In my remarks on that gentleman's system, made at the request of the Right Hon. Sir John Sinclair, I humbly submitted, that Mr Greg seemed to me indebted to the previous rotation of two crops and a fallow pursued on the lands he farms, for so many years *immediately* before he began his present operations, for the success that had till then attended, and might, for a few years longer, still attend his mode of culture. These lands having been long regularly fallowed once in three years, probably for half a century past, must, on that account, have been remarkably free from root-weeds, and also from slugs, grubs, &c. These vermin and their nidi being so often disturbed and exposed to birds and the weather under the fallowing system, could hardly indeed have existed in the soil. In this part of the British islands, and, it is believed, in most others, unless lands under convertible husbandry be repeatedly turned over by the plough in the months of May, June, July or August, once in four, five, six or seven years, according to circumstances, root-weeds of certain descriptions cannot be kept under, viz. tall oat grass, (provincially with you knot-grass), couch-grass, the common rough or curved thistle, &c. But it may safely be predicted, that the quantity of vermin that must necessarily be *ultimately* generated in most soils under *Mr Greg's system*, will so eat, wound and weaken grain crops, clover, &c. when in an infant state, that these will seldom pay the expense of rent, cultivation, &c. Even in gardens, it is found necessary, or at least advantageous, to dig over and expose ground sometimes to the summer sun, to destroy the nidi of insects, which no other process can accomplish. If these facts and their consequences be admitted, may it not be inferred, that, whatever injury soils may sustain by the escape of a part of the food of

plants from them in a gaſeous ſtate, waſhing away ſome of their finer parts by rain, &c. when frequently expoſed to the atmoſphere in the fallowing or cleaning proceſs, (which in ſome caſes may certainly be conſiderable, and which, it is humbly preſumed, may amount to the ſubſtance of Dr Davey's objections to the frequent expoſure of ſoils to the ſun and air), theſe loſſes will be much more than amply compenſated to the Britiſh farmer, and conſequently land-owner, by a more perfect preparation of the ſoil for its various crops *in other respects*, than Mr Greg's ſyſtem can poſſibly admit of? It may be aſked, of what benefit can the nutritive gaſes contained in lands be to their cultivators, their owners, or the community at large, if, inſtead of producing grain, roots, &c. for the uſe of man and domeſtic animals, theſe gaſes be either immured, or, as it were, ſealed up in the ſoil, or moſt of them applied to nouriſh uſeleſs weeds, or feed noxious vermin? The queſtion with the land-owners may be, (admitting weeds not to get the aſcendancy, or, if they do, that they will not exhauſt the nutritive gaſes, which there is no reaſon to ſuppoſe they will not do), whether they will confine all the nutritive gaſes in their lands, and get little or no produce from them, or, by a different mode of culture, allow ſome of theſe gaſes to eſcape into the atmoſphere, that the crops on their lands may get the benefit of the remainder, and, by this means, afford a fair and well paid rent?

I do not know how long Mr Greg's ſyſtem may have been practiſed; but, unleſs more than ſix years have elapſed ſince he commenced it, experience, that great corrector of all theories and experiments, has not yet confirmed it, and forbids agriculturiſts placing implicit confidence in a ſyſtem ſo contrary to the beſt, hitherto known and practiſed, even though ſanctioned by the unqualified approbation of the firſt chemiſt that ever exiſted. Till more than ſix years have elapſed, and that Mr Greg's lands ſhall then appear to be in a fair, clean, productive ſtate, at leaſt equal to that of thoſe of *similar quality under the most approved modern rotations*, nothing can be claimed by Mr Greg or his abettors as deciſively inſtructing the utility of his ſyſtem; becauſe lands, in the clean ſtate theſe muſt have been in when Mr Greg entered to them, could hardly any of them have required fallow, under a tolerable ſyſtem, any ſooner than in eight or nine years. It will even be neceſſary to do more. He muſt ſhow that none of his lands, at the end of eight or nine years, are *verging* towards a ſtate of foulneſs, ſo as to require fallow, or more than *one* ploughing in a ſeaſon. If he cannot do this, he yields the point, of courſe; as his ſyſtem precludes him from the only known modes of reclaiming lands that have a tendency to degenerate into a ſtate

of foulneſs and non-production. If, on the other hand, none of Mr Greg's lands, at the end of eight or nine years, ſhow any tendency to degenerate into foulneſs and non-production, his ſyſtem certainly deſerves *at leaſt* a fair trial on lands of a *ſimilar* quality. At all events, his merit is very conſiderable for having had the ſpirit to make ſo bold and intereſting an attempt to abridge labour, and increaſe the productive ſurface of the country, by giving his lands under grain crops and turnips one ploughing only annually, and baniſhing ſummer-fallow from a conſiderable portion of the arable lands of the kingdom.

I have only to add, that, if I recollect right, Mr Greg complains of the ſtupidity of the farmers in his vicinity following ſo bad a ſyſtem as that of ſummer-fallow every third year. This ſyſtem certainly deſerves ſtrong reprobation. Bad as it is, however, I may perhaps be excuſed for conſidering it, on arable lands in general, as *ultimately* preferable to Mr Greg's own. But it is hardly fair to accuſe farmers of practiſing a bad ſyſtem, which, it appears from Mr Greg's printed ſtatement, the covenants in their leaſes, under ſevere penalties too, if I miſtake not, abſolutely *bind* them to purſue.

Yours ſincerely,

JOHN SHIRREFF.

SINCE writing the preceding obſervations, I have ſeen the Report of the Bedfordſhire Gentlemen, on the ſtate of Mr Greg's farm, which ſeems very candid and encouraging. The following remarks on it are humbly ſubmitted.

Page 7th of Report.—It appears the land of Mr Greg's farm is generally *ſound at bottom*. How little arable land of this deſcription there is in the iſland, compared with land of a different nature, and more apt to run into foulneſs, is well known.

Page 10.—What ſpecies of graſs is *black* graſs?

Page 11.—Inſtead of a dry ſpring or early ſummer furrow being the cure for root weeds, and the means of producing a good wheat crop, moſt farmers in this country would conſider a dry furrow in *Auguſt* as tending more to produce that effect.

Pages 15–16.—Barley may be conſidered a precarious crop on ſtiff or ſtrong lands in general, unleſs after ſummer fallow, or potato, or turnip that has been removed from, or conſumed on the field, and the land ploughed up before Candlemas, to be mellowed by froſt. This being admitted, militates againſt Mr Greg's ſyſtem.

Page 19.—Drilled beans are certainly a great mean of *keeping* land clean; but, *that* ſummer fallow muſt be imperfectly executed indeed, which does not leave the ſoil in a very ſuperior ſtate of radical cleanneſs to that in which it can poſſibly be put by any mode of cleaning drilled beans yet known.

Page

Scale of Feet

Fig. 1.

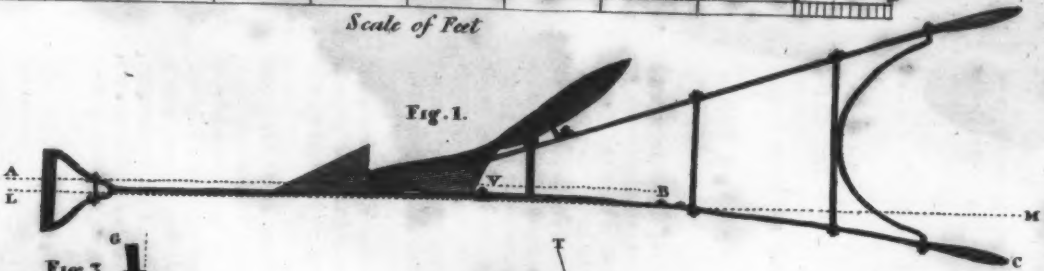


Fig. 3

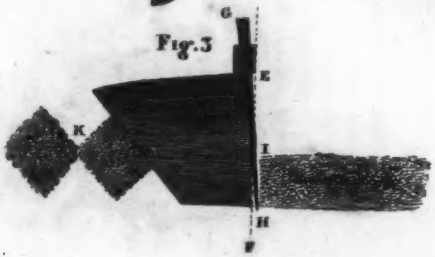


Fig. 4

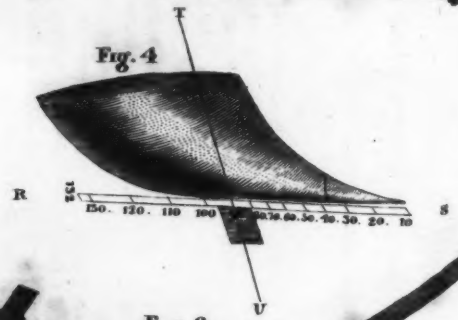
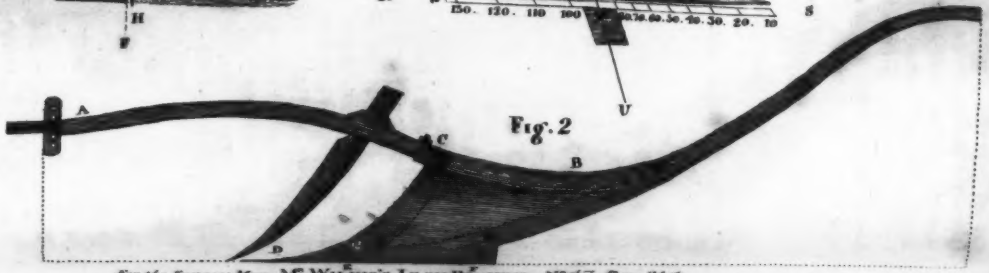


Fig. 2



For the Farmers Mag. Mr. WILKIE'S IRON PLOUGH. No. 47. Page 361.

Page 20.—Here ſymptoms of want of expoſure to the atmoſphere are perhaps perceptible. The crops of wheat were better after the ſcarifier than after clover, where the ſoil had lain undiſturbed for ſome ſeaſons.

Page 21.—The Bedfordſhire gentlemen ſtill ſeem to conſider ſummerfallow neceſſary to *get rid* of root weeds.

J. S.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Introduction of Iron Ploughs; With a Figure.

SIR,

THE plough being an implement of the very firſt importance in agriculture, it is of conſiderable conſequence to the farmer to have it conſtructed upon juſt and mechanical principles, and of the moſt durable materials.

Malleable iron, from its great ſtrength and durability, ſeems beſt calculated for that purpoſe. Hence, various attempts have been made to make the plough wholly of malleable iron; but, either from ſome defect in the conſtruction, or by being made too weighty, or, perhaps, from both theſe cauſes, iron ploughs have never come into general uſe. Prejudice, too, may perhaps have had a ſhare in obſtructing ſuch a valuable improvement from having had a fair trial.

The recent eſtabliſhment, however, of farming ſocieties all over the united kingdom, with other cauſes, has now given a new impulſe to every branch of agricultural improvement, unknown in former times.

Farmers now eagerly inquire after agricultural knowledge, and improved implements of huſbandry; and that knowledge, both with regard to the art and the implements, is greatly facilitated by the univerſal circulation of the Farmer's Magazine.

From theſe conſiderations, therefore, we may expect that a matter of ſuch importance as the conſtruction of an iron plough (where ſtrength, lightneſs, and durability, are all abſolutely required), will meet with a fair diſcuſſion in your valuable publication.

With your permiſſion, Sir, I ſend you a drawing of an iron plough, which is conſtructed nearly on the ſame principles as thoſe I make of wood, now in general uſe in the neighbourhood of Glaſgow, and through the weſtern parts of Scotland. Fortunately, the peculiar form of the head, ſock, and mouldboard of this plough, is more particularly adapted for the

construction of an iron plough, than perhaps any that has yet been invented.

The beam, which is 6¼ feet long, is wrought quite straight on the landside, and tapered towards both ends on the furrow side (when made either of wood or iron), as represented by the dotted lines A B, Fig. 1st. By forming the beam in this manner, the mortise for the coulter is gotten more to the right of the landside plane, than if the taper were taken off the landside, as has been recommended by some of those who have written on the formation of ploughs. The advantage of this position of the coulter will be understood, by consulting Fig. 3d, being a cross section of the plough. The dotted line E F, is the landside edge of the sheath G H, the coulter intersecting the landside plane at I, about 6 or 7 inches above the sole, that being the depth of an ordinary furrow. The plough, in that case, has no twist, nor projecting parts on the landside, to give resistance to its motion, except the point of the coulter itself, standing half an inch to the left of that of the sock at H, which is necessary for clearing the landside of the plough, and also to give greater depth and boldness to the shoulder of the said furrow at K: the furrow has, in that case, the advantage of being cut, and of standing, when turned over, from 10 to 15 degrees above the square. This position of the furrow is certainly the best for receiving and covering the seed; a matter of the first importance.

The left handle at C stands 7 or 8 inches to the left of the landside plane, as may be seen by the dotted line L M, Fig. 1st. This position of the left handle, with the form of the beam that has been described, and position of the coulter G H, Fig. 3d, gives every possible advantage in cutting the furrow with a bold shoulder. The ploughman is thereby permitted to walk with ease in the bottom of the furrow, and betwixt the handles, keeping the landside plane of the plough perpendicular to the horizon; —whereas those, whose left handle is in a straight line with the landside plane of the plough, must be laid over to the landside above, to enable the ploughman to walk in the furrow. When that is done, the point of the coulter is turned more towards the furrow, and from the landside; of course, the shoulder of the furrow which it cuts is not so bold and full, the friction is increased, and the mouldboard is kept too far from the furrow slice, and on that account does not set it in a proper position.

The mouldboard comes next under consideration; and it is generally allowed, that a mouldboard which is calculated for ploughing a free and loose soil, and for working fallow completely, is by no means adapted for making neat work in lea land, or in a clay soil. Hence it is necessary for the farmer to have two sorts of

of ploughs; one for fallow, and another for seed-furrow work; or to have two kinds of mouldboards fitted for one plough, which can be easily changed at pleasure by the ploughman, if the plough is made of iron, and agreeably to the above plan. I therefore have formed two mouldboards to be used for this plough, as it may best suit the convenience of the farmer. The first, or seed-furrow mouldboard, I constructed about eleven years ago, and have used it ever since; in the course of which time, I have made upwards of 3000 ploughs. With regard to the curve, or twist, of this mouldboard, it may be understood by attending to Fig. 4th. The scale, R S, is divided into 132 degrees; and the twist of the mouldboard is delineated by the distance at which these degrees are placed from each other. Towards the point of the sock, the divisions are large; but they become gradually closer until No. 90, where it is understood the furrow has gotten perpendicular; after which, the curve gradually diminishes towards the hinder part of the board, as appears from the greater distance of the degrees from each other. As the twist is regulated by a common bevel, or suitstock, the blade must stand at an angle of 110 degrees from the square of the stock, when applied to the sole of the mouldboard, as represented T U, Fig. 4th.

The second, or summer-fallow mouldboard, is the same as Mr Small's, which, being so well known, requires no particular description, and is made to fit the plough equally well with the other; and, from its different shape and width below, and at the hind end, is particularly adapted for working fallow.

Fig. 2d gives a profile of the plough. A B, the beam, 6½ feet long, and 2½ inches deep, by 1 inch thick: at the coulter hole it is 3½ inches deep, and 1¾ inches thick. The sheath is fixed to the beam by two screw bolts; one goes up through the beam at C, the other is seen at V, Fig. 1st. The stilts are 2 inches deep, and ¼ inch thick. D the sock; E F two screw bolts by which the head is fixed upon the plough.

I am, Sir, your very obedient servant,

Uddingston, 17th July, 1811. JOHN WILKIE.

FOR THE FARMER'S MAGAZINE.

Comparative View of East Lothian Husbandry in 1778 *&* 1810.

PART III.

THE management of grass lands was proposed to be treated of in the third chapter of this Comparative View; and the scheme laid down for illustrating that subject (*vide* p. 59.) contained four sections. 1. With respect to the crops with which grass seeds

were sown: 2. The appropriation of these grasses: 3. The length of time that land is kept in grass; 4. The crops taken when grass land is ploughed. On each of these points we must be brief, so as room may be left, in this part, for another chapter. And, before going further, it may be remarked, that the two preceding chapters having run to a greater length than was expected, we are under the necessity of limiting the remaining chapters to smaller bounds, in order that the whole of this Comparative View may appear in one volume.

1. *Concerning the crops with which grass seeds were sown.*—In 1778, grass seeds were seldom sown with the corn crop that succeeded a summer fallow, but generally with the second crop of the rotation; that is, with barley that had succeeded fallow wheat, or with oats taken after Lincoln barley, raised upon land that had been summer-fallowed;—a mode of cropping at that time very prevalent, especially upon soils of inferior quality. The seeds sown were clover and ryegrass; the proportion of each being almost in every case 16 lib. of clover, whereof ten were of red or broad clover, and 6 of the white or Dutch kind, with 2 bushels of perennial ryegrass, to each Scotch acre of ground. As land thus sown usually remained several years in pasture, a large mixture of white clover and perennial ryegrass with red clover, was a necessary measure; as, without it, a scarcity of plants would have soon occurred. Yellow clover was likewise sown by some farmers, chiefly in the upland part of the district, and with a greater quantity of ryegrass than in the lower districts. Yellow clover, however, having seldom been considered as a good feeding plant, the use of it is now given up by many people. Indeed, it never was extensively sown in the district.

At this era (1810), nearly the whole of the fields fallowed and turnipped in the preceding year are sown with grass seeds amongst the first crop of corn, no matter whether that crop is either wheat or barley; while some people, who do not sow grass seeds with the first crop of wheat, take drilled beans—after that wheat—then barley—with which grass seeds are sown. Red or broad clover is now chiefly used as seed, to which a small quantity (generally from two pecks to a bushel) of ryegrass is added. Annual ryegrass has of late been a plentiful article, and is, by accident, often sown upon lands intended to be pastured for a few years, to the great loss of the occupiers. It is a matter of little importance, however, when the land is intended to remain only one year in grass, whether the seed is of the annual or perennial varieties. By some people, the first is considered as the most productive; but, whatever kind is sown, it is a matter of great importance to have

the

the seed clean, as we are almost sure that many weeds have been introduced into the fields of the district, through the medium of grass seeds imported from England and other countries.

Appropriation of grasses.—In 1778, a small portion of grass was appropriated to the soiling of horses; a larger quantity was manufactured into hay, which was either sold, or consumed upon the premises during the winter and spring months; but perhaps seven-eighths of the grass land was depastured with horses, black cattle and sheep, though these animals were rarely allowed access till the second year, from an apprehension that the grass would be injured were earlier access permitted. This, of course, caused the scythe to be generally used in the first year, to the great injury of the after crops. Exceptions there were to this rule, in many places. We only speak of the general practice; and this was, in 1778, to cut grass in the first year, (if it would cut), and to pasture it for the succeeding years, or till the plough was again introduced.

At this time, a complete change of system has occurred; the extent of grass land in the district being more than double of what it was in 1778, while the mode of appropriation is materially altered. The soiling of horses is almost an universal practice; and, to a certain extent, the soiling of milch cows and neat cattle is also practised. The manufacture of grass into hay is likewise considerably increased, while the cattle and sheep fed in the district may safely be estimated at triple the number of those fed in 1778. This is owing, 1st, to the extent of grass land being increased; 2d, to the sowing of grass seeds with the first crop after fallow; and, 3d, to pasturing them in the first year, when the crop is of double value, and capable of supporting a far greater number of animals than afterwards. The most important change of system has taken place upon the coast-side lands. There, little more grass than was necessary for the support of the working stock and milch cows, was to be seen in 1778; but now, when regular husbandry is followed, large and fine fields of grass are to be discovered on every hand, on which a great many cattle and sheep, chiefly the latter, are fed, contributing not only to the improvement of the soil, but serving also to promote the interest of the occupier.

Length of time that land is kept in grass.—The most of people, in 1778, would have looked upon it as a sort of crime to have ploughed up grass after one year's growth; hence, such a practice was scarcely known at the period our Comparative View commences. At that time, land in grass was rarely ploughed till it was five years old, often eight and ten years; though exceptions sometimes occurred, as must always happen in

such cases. The first change of system originated upon the farms of Longniddry, in consequence of a desire to take wheat after clover; and gradually the change spread over the whole district. To take wheat after clover, is a mode of cropping latterly departed from by many of the first farmers in the district; it being ascertained from experience, that oats may be cultivated with as much, if not more, advantage; while the land, in that way, is preserved in far better order. If a rotation of six is strictly followed, it is plain that one half of the land under corn crops, or one third of the whole farm, may annually be under wheat; and we do not think that the wheat system can be extended further with much advantage, unless it be upon lands capable of producing wheat and beans alternately, the breadth of which is not great. Sentiments such as these have guided the majority of farmers for many years; therefore, oats are now taken, in nineteen cases out of twenty, after grass; while it is only in a few instances that land remains in grass longer than one season, if the management or mode of cropping is discretionary, or at the choice of the occupier.

The crops taken when grass land is ploughed.—In 1778, when grass land was ploughed, it was customary to take oats, barley and oats, as the three first crops; and then, either to summer-fallow; or, if the land was in any sort of order, to sow peas, and next wheat, and then to summer-fallow. The error of that period was, to take corn crops so long as the ground was capable of carrying them, and never to summer-fallow till the soil was worn out and exhausted. When old grass land was ploughed, sentiments such as these guided the conduct of every farmer. It was supposed, that, as a long rest had been enjoyed, the ground was able to bear a drubbing, without being deteriorated or injured; hence, severe cropping was always exercised when grass land was broke up, though often not to the benefit either of the soil, or of those by whom it was occupied. Such a mode of management may now be said to be completely departed from; it being found, after repeated trials, that it is much more beneficial to summer-fallow in the second year, when old grass land is ploughed, than to attempt the cleaning of it, even though in a rich state, with a view to have a corn crop. This system is now adopted by the best farmers of the district; though, if the soil is of a light quality, or what is naturally calculated for turnips, a crop of that valuable esculent is of course substituted for summer-fallow.

Very little old grass now remains in the district; therefore, few farmers are under the necessity of regulating their operations by the rules which we have mentioned. Perhaps three

fourths

fourths of the whole land in grass is annually ploughed; and sown with oats. If that land is of clay soil, it is either cropped with beans, or summer-fallowed after the oats; but if it is of light soil, turnips, in almost every case, are taken in the second year. As already said, there are exceptions to every general rule; but, taking the whole of East Lothian, it may safely be affirmed, that the management exercised, when land is broken up from grass, is fully as correct as that of any other district. It is in fact nearly similar, in some respects superior, to the husbandry of Norfolk,—a district well known to be managed in a more perfect manner than any other in England.

The political economy of the district, affecting tenants, falls now to be discussed. It was proposed to investigate that portion of our subject under five heads or sections; viz. 1. Concerning the rent of land; 2. The extent of public burdens; 3. Condition of turnpike and parish roads; 4. Value of labour; and, 5. Value of produce at the two eras of 1778 and 1810.

1. *Rent of land.*—In 1778, there was not much land rented above 30s. per Scotch acre, and little even so high; as that sum had only been given, a few years before, for some farms of rich land upon the coast-side, chiefly belonging to Mr Nisbet of Dirleton. It is probable, that three fourths of the district, we mean the arable part of it, were not rented higher than 15s. per acre at the above era. Nor will this appear surprising, when it is considered, that 20s. per acre had long been reckoned a fair rent for arable farms that were not possessed of some particular and local advantages. Indeed, we have heard of a saying or maxim of the late Mr Anderson of Castleton, a distinguished farmer of the old school, viz. that no land should pay 20s. per acre, unless it was capable of carrying good wheat after summer-fallow without manure. During the century, or rather from the Union to 1778, rent had not altered materially. The first rise, of any magnitude, took place at the setting of Mr Nisbet's estate in 1771, though, from after circumstances, that rise turned out to be less than was at first apprehended. The rents were formerly payable in grain; and, calculating the value of that grain according to the fiars of the preceding twenty-one years, a considerable rise of rent appeared; though, as the value of grain gradually advanced afterwards, the rise was more nominal than real.

It is difficult to estimate, with precision, the great rise which has taken place upon rent since 1778; but, speaking moderately, rent may be said to have tripled in the short period of thirty-two years, owing, in some measure, to certain causes unconnected with

with the increased value of produce,—such as the general introduction of two-horse ploughs and thrashing machines, and the numerous improvements in rural art which have taken place within that period, whereby the same farm is now capable of furnishing a far greater quantity of disposeable produce than in former times. In short, there is not a doubt but that rent has advanced fully as much as we have stated, even though the standard was applied to the whole district. Exceptions may no doubt be made to that standard, as several farms are still possessed upon leases that were granted before 1778; but, on the other hand, there are many instances of rent having quadrupled since that era; and these are numerous enough to make up for any supposed deficiency in the ratio of rise which we have condescended upon.

We by no means intend to say, that rent has risen as the means of paying it were increased,—being decidedly of opinion, that offerers, in many instances, trusted too much to what is called the growing prosperity of the country; in other words, they trusted that money would continue to fall in value, and that the price of produce would of course be gradually increased. It is highly probable, that sentiments such as these governed many people, though considerable doubt may be entertained of their correctness. The first serious rise of land-rent occurred in 1795, when wheat bore a very high price; and this rise gradually advanced till 1801, when peace was concluded with France, after which it remained stationary till the new law was passed for regulating the import and export of corn. That law certainly occasioned prices to advance; because, if it be according to fact, as generally admitted, that the island does not produce a sufficient quantity of grain for supporting its inhabitants, importation could never take place, till the average of prices exceeded the rates fixed by that law. Reasoning upon these principles, prudent people considered that prices, on an average, might safely be estimated according to the rates fixed in 1804, when that law was passed; as, if prices were below these rates in one year, it was fair to suppose they might be as much above them in another. Though these were the sentiments of prudent people, it is quite evident that they had little weight with many of a different character, as land was taken far above the rent which any fair calculation from the corn laws would warrant. The evil seems now, however, to be working its own cure; and it is probable that rent will gradually return to the place it stood in the scale when the peace of Amiens was concluded.

Public burdens affecting the tenantry.—The direct public burdens which fell upon the tenantry in 1778 were inconsiderable, being

being solely confined to statute-labour upon the parish roads, which, strictly speaking, was no burden, being compensated by the increased comfort and conveniency of travelling over these roads; and the old window-tax, which, before the passing of the commuation act, was of a trifling nature. The only other direct burdens, which at that time could possibly fall upon the tenantry, were one half of the poor's rates, and one half of the schoolmaster's salary; but as the former was then almost unknown in this district, and the latter so trifling as hardly to be worth the while of the landlord to have recourse for them, these burdens need scarcely be mentioned.

Very different, however, is the situation of the tenantry in 1810,—the extent of *direct* public burdens being nearly 10 per cent., or two shillings in the pound, upon the rent they have agreed to pay to their landlords. The property-tax, at all events, is one shilling in the pound; and, in some cases where valuations have taken place, considerably more. The value of statute-labour is double of what it was in 1778; and the window-tax is equally augmented. Besides these, the tax upon farm and saddle-horses is considerable; while the assessments for the poor, now pretty general, and the one half of schoolmasters' salaries, are considerable items. Taking the whole together, it may safely be affirmed, that the tenantry pay twenty times more direct taxes than they did in 1778. The extent of these burdens must eventually lessen the amount of rent; and very likely this is one of the causes why that amount has already declined, as, without these burdens, tenants would be capable of paying higher rents; though few landlords have as yet taken such a view of the consequences arising from taxing the tenantry in a direct manner.

3. *Roads.*—The road management of the district has seldom been considered as beneficial, or as containing any thing from which other districts could receive useful information; and though the first turnpike bill, and the first bill for commuting statute-labour from work into money, were applied for and obtained by the landholders of East Lothian, there is cause to suppose, that the full advantages of either have not hitherto been obtained. A very few words on these important topics may be stated; it being inconsistent with our limits to enter upon any extended detail concerning them, notwithstanding of their acknowledged importance.

Before 1751, the whole roads of the district were supported and repaired (if these terms are applicable to the state in which the great post road was then kept) under the provisions of the general statute-labour act of Scotland, whereby every tenant was bound to work six days with his horses and carts, and every house-

holder

holder to perform six days service towards the repair of the public roads. It was early discovered, that the roads could not, by any degree of exertion, be made good under the provisions of that act; therefore, in 1751, an act of Parliament was procured for erecting turnpikes, and levying tolls, on the great post road running through the district which leads from Edinburgh to London. This was the first step to improvement; and there being then a great many public-spirited men among the trustees appointed for carrying the act into execution, the worst parts of the road were speedily repaired, though it was not sooner than 1769 that the whole line was put into decent condition. At that period, the act being soon to expire, a new one was applied for, in which, *inter alia*, some useful regulations respecting the statute-labour were included. According to these regulations, the trustees or heritors who possessed lands of one hundred pounds Scotch valuation, with some others, such as the eldest sons of these heritors, and the chief magistrates of royal burghs within the district, were empowered to make up a list of the ploughgates of land, and to commute the value of labour exigible from each ploughgate into a money payment of twenty shillings, or to take one half of the statute-labour in kind, that is, three days work of a cart and two horses, and the remainder in money, as to the heritors of the several parishes might seem most expedient. With regard to the householders, instead of six days labour, (an enactment never made efficient), the act of 1769 ordained, that every one possessing a house of twenty shillings yearly rent should pay 18d. towards the repair of the roads. These enactments were wise and salutary; though, unless they were carried into execution with vigour and energy, it is evident the laudable designs of those by whom they were brought forward might be completely disappointed.

In 1778, the first era of this Comparative View, the roads of the district were gradually getting into better condition than in former times; though there is reason to presume, that a degree of laxity in executing the act of 1769 afterwards took place in several parishes. It is not wished to revive a dispute which occurred in 1792 betwixt the heritors and the tenantry, when various lines of road were proposed to be put under the turnpike system, notwithstanding it was then satisfactorily ascertained, that certain parishes had been singularly negligent in the administration of the road-work. But it may be added, that, in consequence of that dispute, more attention was afterwards paid to the roads, and, of course, that the public interest was thereby promoted; as, since that period, no parish can escape from the consequences of not allocating and not performing statute-labour upon

upon the roads; though it is well known that many, who performed no work, escaped in former times.

At the last era (viz. 1810), the great public roads may be viewed as in good condition; though, as many of them had originally been *lined out* in an improper manner, that is, had been carried over high grounds, and formed too narrow for the trade of the country in its improved state, few can be considered as equal to the roads of other districts that have been made or repaired since the system of making roads became better understood. Some of the parish roads are good, especially where the heritors or trustees have paid suitable attention to the business entrusted to them; but, in the way in which statute-labour is generally managed, it is not to be expected that the by-roads can be preserved in good order. The work is frittered down, or divided into so many small portions, to meet the views of individuals, that a continued line of good road can seldom be obtained. Besides, it is much more expensive to support the roads of some parishes than others; therefore, so long as the funds of each are the same, it is physically impossible to keep the whole in the same state of repair. Good roads, however, are an object of such importance to every country, that few things more particularly deserve the attention of those to whom its internal political management is committed, than the collection, appropriation and administration of the funds destined by the legislature for their support and repair.

4. *Value of Labour.*—Independent of the change which nominally occurred in the money-value of labour from a depreciation of the circulating medium, the real value of that article has also been considerably increased during the period to which these inquiries are directed; in other words, the labourer, particularly if employed at rural work, receives a good deal of more corn, or other necessaries of life, as a compensation for his labour, than he did in former times. This will appear from the following statement.

In 1778, the wages of a hind, or married farm-servant, generally consisted of thirteen bolls of grain, maintenance for a cow through the season, and so much ground free of rent, as could properly be sown with one peck of lintseed. Of the grain, it was customary for each to sell three bolls or so, according to the size of his family; and the money thus obtained, added to what was got for butter, formed the only fund from which clothing and other necessaries could be purchased. Now, as the cows of farm-servants were usually, at that period, kept upon the outfield pastures, the quantity of butter produced could not be great, especially as a small part of it was used in the family. No land for potatoes was then given to servants; but it must be stated, that

that as gleaning was then universally permitted, servants who had families often procured, in that way, three or four bolls of grain during the harvest season.

The first change of wages took place about 1780, at which time a small piece of ground, without dung, was given for raising potatoes; which extent of ground was gradually increased to about one tenth of a Scotch acre, with a full quantity of dung. But a more important alteration took place in the pasturage of the milch cows; as, instead of allowing them to roam on the outfields through the day, harassed by dogs, and put into the straw-yard at night, they were now kept in enclosed fields, that had been properly sown down with grass-seeds. Again, in 1792, two bolls of more grain were added to the wages of farm-servants, and the like additional quantity about ten years afterwards; so that the married farm-servant now receives seventeen bolls of grain, viz. 12 bolls, or 72 bushels of oats; 3 bolls, or 18 bushels of barley; and 2 bolls, or 8 bushels of peas, all of the best quality that the farm produces. Even the introduction of potato oats was of considerable benefit to farm servants, as they are now generally paid in that variety. Now, as potato oats usually sell fourpence per bushel higher than other sorts, this of itself amounts to one pound four shillings per annum on the above quantity.

From what is here stated, it will appear that, besides the increased money-value of wages paid to them in 1778, farm-servants receive, in 1810, 4 bolls, or 24 bushels, more of oats, than they did at the former period; while the quality of the whole oats paid to them is fully 10 per cent. of greater actual value when manufactured into meal. But the additional value of the grass on which the milch cows are depastured, is considerable. Were we to suppose milk and butter to be at the same prices in 1810 as they were in 1778, the increased quantity of both articles, in consequence of superior feeding, would nearly make one cow as productive in 1810, as two were in 1778.

It is in this way that the rise or fall in the value of labour can be best estimated and ascertained. A man paid in money may be no better than formerly, even though the amount of his wages is nominally doubled or tripled. But, when wages are paid in the necessaries of life, an increase or decrease of the quantity of grain, and other articles given in name of wages, shows at once whether the value of labour has risen or fallen.

Value of Produce.—There is no branch of this Comparative View more difficult to be discussed than the value of produce at different periods,—that value being guided and influenced by so many causes, both of a moral and physical kind, and so fluctuat-

ing and unsteady, that the estimates of one year are almost inapplicable to the circumstances of another. With regard to grain, these remarks are particularly just; therefore, we shall only state, that the value of grain, as ascertained by the fiars of the district for 1778, was as follows.

Wheat	L. 0	18	0
Barley	0	14	0
Oats	0	11	6
Peas	0	9	0

At the above period, beef and mutton were usually sold at 2½d. and 3d. per lib., Amsterdam weight, during two thirds of the season; and, in the remainder, at 3½d. and 4d., but seldom higher. Lamb was commonly purchased, after the end of May, before which month it was always a scarce article, from 1s. to 18d. per quarter, according to quality. Butter from 6d. to 8d. per lib. Scots weight, and eggs at 2d. and 3d. per dozen.

Though there was a gradual advance upon these articles prior to 1795, the rise was not considerable till that year, when all kinds of grain rose to unexampled prices. Soon afterwards, the value of butcher-meat also rapidly increased; and as it is not an article that can be imported, at least in a fresh state, the increased value thereof stands a better chance of being permanent than that of corn, especially if the country continues in its present flourishing condition. Corn can never be safely estimated above the importation rates; as, when peace is restored, there is a moral certainty that prices will run in unison with those rates, unless in seasons when crops have failed on the Continent.

The fiars of the county for 1810 were—Wheat 47s. 6d.; Barley 31s. 5d.; Oats 24s. 11d.; Peas 26s. 10d. Fat cattle sold from 10s. to 11s. 6d. per stone Amsterdam, sink. Sheep nearly at the same value; and lambs from 16s. to 24s. per head. Butter 16d, 18d., and 20d. per lib. Eggs 9d to 12d. per dozen.

From the above scale of prices, it appears that grain has not advanced in value since 1778 more than other articles, notwithstanding the value of labour employed in cultivating grain being increased considerably. The expense of managing grass land, or of bringing the articles of its produce to market, are trifling, when compared with what is required in the culture of arable land: Hence it would appear, that the profits of the grazier must of late years have exceeded those of the corn farmer, though it has often been remarked, that the rise upon live stock has been of greater benefit to the breeder than to the feeder.

N.

(To be continued.)

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

SIR,

I BEG leave to send you a description of the drawings of Fiorin grass * promised in the note to my paper in the last Number of the Magazine, with some additional observations on the subject, accompanied by a letter from A. C. Maitland esq. to Alexander Young esq., and another which I had the honour to receive from Dr Richardson himself, both of which you are at liberty to publish. Your obedient servant,

Abbey-Hill, Edin. Aug. 1. 1811. JOHN SHIRREFF.

Description of the Plates.

PLATE I.

Fig. 1. & 2. represent a plant of *the Agrostis cultivated by Dr Richardson*, taken from nature about the middle of June last, with roots, leaves, young flower-stalks, and strings; one stolo or string, having projected about sixteen inches, and thrown out roots at two of its joints, which are seen in the plate.

N. B.—These figures are reduced to about one third the size of nature.

Fig. 3. represents a panicle of *the Agrostis stolonifera of botanists*, in a diseased state, something like the smut in wheat, taken from Mr Knapp's Gramina Britannica.

Fig. 4. represents a healthy panicle of the same plant, from the same work, coming into blossom.

Fig. 5. represents the same panicle past flowering, ripened, and decaying.

N. B.—The three last figures about one fifth the size of nature.

PLATE II.

Fig. 1. represents a panicle of Dr Richardson's Agrostis, or Fiorin, in full bloom,—the size that of nature. This, however, seems to be the *Ag. alba* of botanists.

Fig. 2. represents part of the extremity of a string of Dr Richardson's Fiorin,—the size that of nature.

N. B.—The figures in this plate taken from nature about 20th of July last.

By attending to the plates, there certainly cannot be great difficulty, in this part of the country at least, where it much abounds, in collecting the strings of Fiorin grass, or that kind of stoloniferous agrostis so successfully cultivated by Dr Richardson. The panicles of the two kinds in the plates, though, when

* Engraved, and given in plates 1. & 2. with this Number.—EDIT.

in bloom, appearing different from each other, cannot, either of them, be mistaken for those of any other of our native grasses, by any person who has been in the habit of examining them, nor, indeed, by any attentive person; not for those of *Agrostis vulgaris*,* which, when in bloom, are quite open, with long, slender, somewhat pliant branches, *all bare* of florets near their bases, or insertions into the main flower-stem, whilst a few only of the longer branches of the panicles, of the kinds figured, want florets at their bases: Besides, the *Agrostis vulgaris* rarely produces any strings; and, when it does set out one or two from a plant, it is late in the season, and then in particular situations only. Nor can these panicles be mistaken for that of *Agrostis brevis*, described by Mr Knapp; the panicle of which, when in full bloom, is ovate, or egg-shaped, and of a light red colour. The branches, too, on examination, will be found nearly all of one length, that arise from around the same part of the stem, and bare of florets near their bases. The stolones are red and short. It is found in wet places of badly cultivated corn fields, and may possibly be what the English farmers call Red Robin.

Although D Richardson describes Fiorin grass as being chiefly the *Agrostis stolonifera* of botanists, he does not object to the employment of any species of *Agrostis*, native of the British islands, that has decided stoloniferous habits; and these dispositions will be found to exist distinctly in two species only—the *Ag. stolonifera* † and *Ag. alba*. As the first botanists do not seem

* Mr Don, late of the Botanic Garden here, has mentioned, in the Third Volume of the Tranfactions of the Highland Society, that the *Agrostis vulgaris* grows luxuriantly on Braid Hills, near Edinburgh, and is not touched by live ſtock. Of this fact, any perſon may ſatisfy himſelf, by going at any time, in open weather, to the north declivity of the height immediately ſouth eaſt of the ſtation of the ſignal poſt, where he will ſee the very appearance Mr Don deſcribes. Mr Don alſo ſays, all the ſpecies of *Agrostis* are diſliked or rejected by ſtock, in paſtures; and this may be true of the flower ſtalks, leaves and panicles of the whole tribe, but ſurely not ſo of the ſtolones of one or two ſpecies: ſo that theſe apparent diſcrepancies in Dr Richardſon's and Mr Don's accounts are not ſo irreconcileable as at firſt appears. Mr Don had never preſented the ſtrings of *Agrostis stolonifera* or *Agrostis alba* to ſtock, but merely, perhaps, noticed their neglect of the flower-ſtalks and panicles of theſe ſpecies. The flower-ſtalks and flowers of many of our graſſes, when paſtured on, are rejected in the ſame way, unleſs very hard ſtocked, pretty early in the ſummer, *e g.* thoſe of perennial rye-graſs, *Cynosurus cristatus*, *Holcus lanatus*, &c.

† This was noticed in the Scots Magazine for November 1809, under the article, 'Monthly Memoranda in Natural Hiſtory,' writ-

seem to have been able to discriminate correctly, upon every occasion, between these two species of *Agrostis*, (compare the figures of both in Mr Knapp's Gramina Britannica, Professor Martin's Flora Rustica, and Dr Smith's English Botany), it is not to be expected that cultivators, or even Dr Richardson himself, should be equal to the task. Nor does it seem, as far as is yet known of their qualities, absolutely necessary that they should be so; because it does not appear which of the two sorts is preferable as Fiorin grass. Nor should any reflection attach to Dr Richardson for not ascertaining, as if by supernatural intuition, in a few seasons, every thing regarding the properties of these two species of this difficult genus of plants; the scientific arrangement of which, seems to have puzzled all botanists. He has given us a greater number of interesting facts concerning their useful qualities, than could well have been imagined possible to ascertain in so short a period. It should not surprise us, that it is not determined which of these two kinds of *Agrostis* produces the greatest quantity of herbage, and which is most relished by live stock, when few, if any, experiments have been made, except by the Doctor himself, to ascertain the different quantities and qualities of *any* of our grasses, on the same extent, and similar quality of soil; and when it is only within these last thirty years that the comparative value and qualities of the different varieties of wheat, the principal and immediate food of man, have occupied much of the farmer's attention. It would not perhaps be difficult to show, that, even at this day, many are, unconsciously, cultivating varieties of wheat, and other grains, totally different from those they wish and intend their crops should be exclusively composed of.

It has been alleged, that Fiorin will not thrive on dry soil. In the Botanic Garden here, may be seen several plants, put into the ground, in the month of March last, on almost blowing sand, which was never known to get any manure; nor did the plants get any water since they were put there, except from the clouds; yet, on the 27th July, the strings had run from two to four feet and

ten, we believe, by Patrick Neill esq., of this city, vol. lxxi. p. 808.—'That nothing but *Agrostis stolonifera* has been employed in Sir John Sinclair's experiments, no one can reasonably expect, who has attended to the difficulty of discriminating the stolones of that plant from those of *Alba* or *Mutabilis*. Indeed, from the very general and loose directions which Dr Richardson gives for collecting Fiorin strings in Scotland and England, and from his making light of any difficulty in selecting the right plant, it appears not improbable, that *Agrostis alba* may hold a distinguished place, along with *A. stolonifera*, even in the Fiorin meadows of Clonfecle.'

and upwards, and were covering the surface thick and numerous.

Several gentlemen and agriculturists have objected to Fiorin grass, as being what they call a coarse grass. By coarseness, they must be understood to mean, if they have really any definite meaning, comparatively great size, roughness, or want of delicacy to the eye, or to the touch. But the value of herbage will be found not to depend on the senses of sight and feeling, but on those of taste and smell. The saccharum, or sugar cane, though about the coarsest and largest, is not the least agreeable and nourishing of all the gramineous tribe; and it was probably on this coarsest species of grass, the saccharum, that his Babylonish Majesty grazed so many years in the wilderness. Annual ryegrass, cocksfoot, tymothy or catstail, and foxtail, are larger in the leaf and ear than perennial ryegrass, and, as these gentlemen would say, coarser: But what say live stock? These prefer the above mentioned grasses to perennial ryegrass.

More than enough perhaps has been said on this head; for it may be considered a work of supererogation to support a question by the feeble aid of analogy, that has already been *established* on the firm basis of fact; *for Fiorin herbage has been found more agreeable to live stock, than any other it has yet been fairly compared with.*

I had an opportunity of noticing a piece of land yesterday, about the sixth part of an acre, on the broken ground *immediately* west of the road leading to the sands by Mr Guthrie's brickwork at Portobello, near this city, covered with a thick mat of Fiorin grass, which is close eaten, while the herbage around is rank, and run into flower. J. S.

Letter, A. C. Maitland Gibson esq. to Alex. Young esq.

My Dear Sir, *Clifton-Hall, 18th July* 1811.

I was yesterday favoured with your letter of 14th, enclosing a copy of your letter to Mr John Shirreff about the Fiorin grass, wherein you mention my name in terms far above my merits.

When I applied to you in the spring, at the request of a friend, for some Fiorin grass roots, you kindly sent me a handsome supply *of real Irish Fiorin*, and added to it a bundle of hay which was made by you at Harburn, during the vicissitudes of the month of December. I kept part of the hay, and offered it to my horses, at that time standing in town, little exercised, but well fed on the best of hay, equally good potato oats, and a feed of fine field carrots daily: they ate your hay keenly. At different times, I gave some to various other horses which came in from the country with articles for the family; and all seemed e-

qually to approve of it, appearing convinced that wet weather in making your hay had no bad effect on it. I rolled some up in a large piece of brown paper, and laid it up in a clothes press in my room; to which my horses gave the same degree of welcome, just before we left Edinburgh at Whitsunday, that they had formerly done, and which I considered as a very strong proof of their partiality for it; conceiving that common hay, laid up in that situation, in so very small a quantity, would not have been equally well received by them. With every good wish for success to your laudable exertions in the cause of Fiorin grass, or whatever other fine botanical name you discover more properly to belong to it, believe me, my dear Sir, yours truly, &c.

A. C. MAITLAND GIBSON.

Letter, Dr W. Richardson to Mr John Shirreff.

SIR,

I am highly flattered by the zeal with which you come forward to defend my *protegé*, Fiorin Grass, against the attacks of its enemies, the British Review, and the paper signed A. S., Edinburgh Farmer's Magazine.

Though anonymous writers are generally held unworthy of notice, yet, I often reply to them, sometimes to prevent their misleading by false statements; at others, when I perceive the author has no other object, but to draw an answer from me to bring his paper into notice; which I consider an innocent artifice, and sometimes indulge him.

My real enemies are the *London Seedsmen* and *Land Stewards*; each consummately ignorant of the agricultural branch (the *gramina*), of which they pretend to know so much; which ignorance I have, and shall persist in exposing.

The Seedsmen, indeed, are very justly alarmed at the introduction of a grass, not propagated by seed, that, of course, will not be called for in their shops, to the no small diminution of their profits.

I have never met with an enemy who objected to Fiorin, from its having failed upon trial: They all argue *à priori*, and search their own wise heads for reasons to show why this grass *ought not* to succeed, at least to the extent stated by me.

These gentlemen should recollect, that that extent is very great; that the advantages *promised* from the culture of this grass far exceed those held out by their amateurs, from that of any other vegetable applied to the sustenance of our cattle.

Will they, then, divert the attention of their countrymen from looking to these advantages? Will they extinguish curiosity, and arrest the hand of the enterprising agriculturist?

They

They are perfectly ignorant whether their sagacious conjectures on the subject of Fiorin be well founded or not; they never saw it cultivated; of course, only guess at the result. Should they be right, and succeed in their endeavours to discourage the cultivation of Fiorin, a few experimentalists are saved the trouble of trial; but, should they be wrong, they have done their country an irreparable injury.

Those who feel interested in the question, and really wish to be informed upon it, should look to the weapons by which the controversy is sustained. My adversaries deal in *opinions*; I in *facts*. They tell us how Fiorin *ought* to turn out; I what it *has actually* produced. I state the evidence by which my positions are supported; and I point out the places where those who are curious may satisfy themselves.

When obliged to retort, I have never failed to show that my antagonist is completely ignorant of his subject. When Mr SALISBURY introduced his wise counsellors, pronouncing of my Fiorin (given him by the President of the Board of Agriculture), *Damn it altogether, it is nothing but squitch;* I had little trouble to show, that neither Mr Salisbury, nor the *intelligent farmers* he introduced, had a correct idea on the subject either of Fiorin or Squitch Grass.

The opinion of a Noble Peer is quoted upon me. His Lordship has pronounced, '*That I shall never make a silk purse of a sow's ear;*' that is, I shall never make squitch grass valuable.

I readily admit, his Lordship has been long in the habit of calling the *Agrostis stolonifera* (our Fiorin) *squitch grass*, and of exterminating it as such;—I fear he has gone too far to recede. But, should his Lordship be so condescending as to admit this question of identity to be still open for discussion, I request him to peruse what Mr ROBERT AINSLIE and you have said upon the subject; he will there find the characteristic differences of Fiorin and Squitch Grass so strongly pointed out, that to confound them (except by wilful mistake) will be impossible.

Within these few days, I have received a letter from a gentleman of high rank in the military service in India, introduced to my communication by my friend *General Close*.

This letter gives such important information on Fiorin, which has been cultivated in India in consequence of General Macan's pronouncing it to be the identical *India Dub grass*, * and his permission

* Although the habits of the Fiorin grass and the Dub grass of India be, in some respects, much alike, they are certainly very different plants, as may be seen from the plate of the Dub grass in the

permission to me to support the assertion by his authority, as I have done; that I shall take the liberty to quote the passage, lamenting that my ignorance of the gentleman's immediate address at present precludes me from soliciting his permssion to sanction it by his name.

'My friend General Close will probably have mentioned to 'you, that, shortly before I left India, I dug and planted about 'six acres with Fiorin, at an expense which was much increased 'by the difficulty of keeping down the twitch, which all my 'care had not been able to eradicate. I had the power of irri-'gation, and a large stable and dairy were abundantly supplied 'in the hot season, when every one around me was digging up 'the roots of grass for the sustenance of their cattle. And I 'had nothing but twitch and other weeds to contend with.'

The great and only difficulty attending Fiorin culture *here* as well as in India, is the extirpation *of twitch and other weeds.* Many have lost their crops from neglect of weeding; an unexpected labour, incurred by the slower growth of Fiorin, whose steady

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fourth volume of the Asiatic Researches, and from dried specimens, a panicle of one of which I have in my own possession. Botanists are not reconciled about the genus of the Durva or Dub of the Hindus. Wildenow calls it Agrostis linearis; while Mr Lambert, V. P. L. S. says, it is the same as the Panicum dactylon of Linnæus, which is found on the shores of Cornwall. *Vide* Appendix to the twenty-second volume of Transactions of Linnean Society of London; Extracts from the Minute-book, Jan. 5. 1802.

If *the Fiorin of Ireland* has been cultivated in India, as mentioned in the Doctor's letter, the question of its thriving there is at rest; but by no means so, if the *Dub grass* has been cultivated there, as and under the name of Fiorin. The Dub grass has flowered at Kew in the open air, and has stood last winter in the botanic garden here, and may flower this season. With respect to introducing Fiorin grass into the West Indies, which the Doctor mentions, in another place, as intended to be attempted, it is difficult to conceive, notwithstanding its great promise of value in high latitudes, what qualities it possesses that can give it advantages over other species of Gramina of very rapid growth in the tropical regions, admitting it would thrive there; *e. g.* Guinea grass (the Panicum polygamum of Willdenow, the Holcus major assurgens of Brown) which grows several inches in twenty-four hours, has been known to grow sixty-three inches in thirty days, and sometimes rises to eight feet high. Live stock in general, and horses in particular, are remarkably fond of Guinea grass; and it is considered next in value to the sugar cane itself. Dr Richardson asserts, that the Guinea grass puts out five strings, as Fiorin does; but, from dried specimens, in the possession of Dr William Wright of this city, it is evidently a different plant altogether

steady and uninterrupted vegetation is outstripped by the temporary paroxysm of weeds and other grasses hurrying to maturity, and then ceasing to grow.

My India amateur seems to have been as little suspicious of the identity of Fiorin and Twitch Grass as *you*, *Mr Ainslie*, or *myself*.

You say, from my authority, 'That Fiorin grows well on 'peaty soils;'—'and has produced luxuriant crops, which are 'mowed the *following* autumn.'

I must strengthen your statement, and show, that Fiorin comes into high profit, with a rapidity unattainable by any other grass.

Last November, I mowed a very good crop of hay from the ground whence I had cut my turf in the May *immediately* preceding. I left it in lap cocks on the spot, until March, for inspection.

Particular circumstances attending this crop gave me great confidence; so much, that being in some sort called upon for a prize essay by the *Farming Society of Ireland*, I gave them in one early in spring last; in which I engaged, on my return home, to cut my turf as usual; then to lay down the ground with Fiorin; and

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gether from Fiorin grass; and Doctor Wright, who was many years in Jamaica, does not recollect that it has *any* stoloniferous habits. Nor does a gentleman, now residing in Edinburgh, who grazed 1200 acres of Guinea grass in Jamaica a few years ago, think it sends out any strings. As there is no winter in these climes, the evergreen qualities of the stolones of Fiorin, their indestructible, and permanently succulent nature, for a length of time after being cut, rendering it so very precious in this country, are of no value there: For, in those regions of perpetual summer, grass can be had fresh and fresh every hour of the year. In North America, particularly in the Northern States, and in Nova Scotia and Canada, Fiorin must be valuable; and, for the same reasons, it is so in this country.—The habits of what is called Scotch Grass in Jamaica, the Gramen Paniceum maximum of Sloane, cat. 30, more resemble those of Fiorin. It is generally supposed an exotic; but Mr Edwards thinks it grows native there. A single acre of this Scotch grass will keep five horses a year, allowing 56 lib. a day to each horse, (which is far too little for working horses.) At this rate, it produces 102,200 lib. of green herbage in the year; and allowing it to lose 75 per cent. of its weight, when made into hay, will yield 11 tons 8 cwt. 14 lib. of hay in the year; not a great deal more than Dr Richardson has actually severed and cured from a statute acre of Fiorin grass in Ireland. Ten or twelve acres of this Scotch grass are a fortune, near a town in Jamaica. It is cultivated in moist or swampy grounds, and propagated by *joints* or roots. The Fiorin might be tried in similar situations there. J. S.

and from that same surface, late in October, to mow a crop of hay *superior* in quality, and *double* the quantity, of any in the United kingdom, of any other grass.

In performance of this engagement, I began to cut my turf on the 20th or 21st of April. I had laid down, about the 12th or 15th, part of an acre, when I was stopped by heavy, continued rains.

In this process, I did not use soil or manure of any kind, save that of the place (*peat ashes*), and of these not a great quantity. When my Fiorin roots and stolones were laid down, I covered the surface with a compost made of ashes and half-burnt sods:—in none of my measures, exceeding the powers of any common farmer.

I had finished this portion before April ended; and was precluded from extending it by the persevering rains, which stopped my turf-cutting till late in June. But this piece is finished so much to my mind, and shows already such luxuriance, that I am confident of success; and admit, that, in case of failure, I have not left myself an excuse.

I must observe that, by a *double crop*, I do not include extreme cases; I mean, double the amount of a very good crop; that is, I expect from five to seven tons to the *English* acre.

I must now call your attention to another circumstance respecting this promise, or, if you please, *bravado*.

It was originally made to a most respectable Society in *my own* country, who have a power and facility of inspecting my crop during the whole time it stands on the ground; and that I most earnestly invite them so to do in that essay.

That the prize Essay in which it is contained is just printed by *Harding*, St James's Street; so that any English, who may come to this country during the summer, have an opportunity of visiting the place, and satisfying themselves.

I now make the same offer to your countrymen, who, at my own request, before sent an inspector upon me, whose report did not contradict any of my wild positions or bravadoes.

I am thus completely committed; and should I fail, effectually disgraced.

I must add, that whatever this crop may turn out *this present year*, it must necessarily improve in the *next*, and the succeeding years. On this important point, every inspector may fully satisfy himself; for I never had the courage to break up a Fiorin acre, once laid down. Of course, I have Fiorin meadow bearing its *fifth, fourth, third*, &c. crops; and one small patch with its sixth standing on it.

I am led so far by this experiment, that I can reply to but one point

point more in your letter. You mention "*hoeing Fiorin;*" * an operation not to be ventured, lest the stolones should be injured. Weeding is no doubt a laborious task; but all obtruders must be pulled up *by hand, when seen*, except the other grasses, for which we must wait until they show their species by their panicles. Coarse dactylis and rush roots may be dug out after the meadow is mowed.

W. Richardson, *D. D.*

Portrush, Colerain, July 4, 1811.

FOR THE FARMER'S MAGAZINE.

On Cocksfoot Grass.

This grass, the *dactylis glomerata* of Linnæus, which is found in most old rich pastures, is getting into use in place of the ryegrass in some parts of England; particularly, Mr Coke of Holkam, in the county of Norfolk, sows it with clover for pasture, and for cutting, it is said. This gentleman mentioned, at his sheep shearing in 1809, that it rises an inch in 24 hours; I presume he means after its being cropped.

Some grasses look withered after being cropped or mowed; but this grass is not stopped in its growth one hour by this operation; but continues always fresh and green.

Mr Coke, at his last sheep shearing, is represented by the Newspapers to have repeated, but in stronger terms, the recommendations which he gave last year to the cultivation of the Cocksfoot, as a grass of most excellent qualities, calculated to carry the greatest quantity of stock, and one that he hoped would in a few years supersede the ryegrass, as he was convinced there could not be a more exhausting white crop than the latter was.

It is not, I think, earlier in Spring than ryegrass; but it keeps the ground much better; and is not easily thrown out, being a very strong-rooted plant, yielding much foliage, and may therefore be preferable for pasture grounds, as well as hay.

Cattle like it when it is young; but as it is naturally strong, rough and coarse, they leave it uncropped when old, unless obliged to eat it, from scarcity of other grasses.

In June 1807, I took notice of the quick growth of this plant, after being cut with a scythe. I have marked in my memorandum book, that I observed, with surprise, it had grown seven inches in as many days.

A. S.

Branch

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* I merely meant that *the intervals* should be hoed, and weeds kept down till the strings covered the whole ground; which certainly can be done *cheaper* by the hoe than the hand. The weeds *in the rows* and *among* the strings, where the hoe cannot be safely used, must be pulled out by the hand. If strong root-weeds appear in future seasons, the dock-spade is the effectual implement for extirpating them. J. S.

BRANCH II.

Review of Agricultural Publications.

General View of the Agriculture of Galloway, comprehending two Counties, viz. the Stewartry of Kirkcudbright and Wigtonshire. With Observations on the Means of their Improvement. Drawn up for the Consideration of the Board of Agriculture and Internal Improvement. By the Rev. Samuel Smith, Minister of Borgue. London, Philips. Edinburgh, Constable & Co., and T. Bryce & Co. 1810. pp. 388.

The province of Galloway was antiently of considerable extent, comprehending not only the stewartry of Kirkcudbright and the county of Wigton, but also a great part of the two contiguous counties of Ayr and Dumfries. In modern times, however, the name of Galloway is only given to that part of the province now politically divided into the stewartry of Kirkcudbright and shire of Wigton; the first of which contains 449,313, and the other 244,498 Scots acres of ground. The figure of the province is very irregular. The sea, which forms a great part of its boundary, indents it in many places with bays, some of which reach far up the country, and extend the benefit of navigation to a large part of the district. The coast, though generally rocky and dangerous to navigation, is well provided with harbours. As for the climate, it is, like that of all the western counties, much inclined to moisture; and, from the prevalence of westerly winds, the winters are more mild than on the eastern coasts. The population of the district amounts to 53,982; of which, 23,772 are in the shire, and 30,278 in the stewartry.

Having premised these general remarks, we shall now present Mr Smith's account of the soil and climate of Galloway; which seems to be correctly given. In our opinion, the soil and surface of a district ought always to be amply elucidated in such reports; as, upon their nature and appearance, added to climate, must depend in a considerable degree the propriety or utility of such improvements as may afterwards be suggested. We do not think exactly with an Honourable Judge, who was pleased one day to say, 'Give me a good climate, and I will make a good soil;' though, undoubtedly, both of them conjoined are of the greatest importance to husbandmen.

'*Soil and Surface.*—The soil and surface of Galloway are so exceedingly diversified, that it is scarcely possible, by any description, to con-

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vey a very clear and distinct idea of them. The aspect of the country, which is singular, ought first to be noticed. Hills rise almost every where, immediately from the shore, to the height of 100 or 200 feet, and sometimes much more. The interior country continues for several miles nearly at the same elevation, though of a very unequal surface, and intersected with innumerable vallies, furrowed out by rivers, or smaller streams. The country is thus divided into a continual succession of hills more or less abrupt. On these the land is for the most part capable of tillage; but in few places does it present a smooth and uniform arable surface. It is one of the most remarkable peculiarities of Galloway, that the surface of the hills is generally broken by abrupt protuberances, steep banks and rocky knolls, diversified into every possible variety of shape. This general character applies both to the shire and stewartry; there are, however, some striking differences between them. The shire has no considerable rivers nor mountains; and though studded with innumerable hills, no county in Scotland is supposed to have less elevation above the level of the sea. The stewartry, widely different, often swells into mountains of large dimensions; and though in the middle of the district, the acclivity is so gentle, that the river Dee, at thirty miles distance from the shore, has only a rise of 150 feet above the level of the sea; yet beyond this distance the country is in general much more elevated, and the range of mountains which divides it from Ayrshire is not much inferior in height to any in the south of Scotland. This extensive range stretches along the whole northern boundary; verges in both extremities towards the sea; and, forming a vast semicircle, embraces nearly one half of the county. Viewed from the lofty summits of these mountains, the rest of the county appears as a great plain; diversified only by a variety of shades, according to the size, distance, or colour, of the interior mountains.

'From the general aspect of the country, a stranger would be led to suppose, that the quantity of arable land, even in what is termed the arable district, is far from being considerable; and that much of this, too, is of no great value. Such conclusions, however, would be extremely erroneous. The flat intervals among the knolls are foreshortened or hid; the knolls themselves, though of no great breadth, fill the eye, and seem to occupy most of the surface: their tops and sloping sides, often covered with furze and brush-wood, seem to be unfit for cultivation, but are usually of a very kindly soil, and of sufficient depth to receive the plough. In an extremely broken field, of which apparently not more than one half is arable, the proportion will often amount to no less than 4–5ths.

'By far the greatest part of the soil of Galloway is of a hazel colour; and of that species which is sometimes termed a dry loam, though it often inclines to a gravelly nature. The bed of schistus on which it lies, is frequently so near the surface, that the plough runs upon it; and where the rock is soft, by its attrition, probably adds

adds a little depth to the soil. Even on such dry hard lands, this is commonly somewhat more than the depth of a furrow: and it appears to retain the fertilizing qualities of dung, better than almost any other soil. Hence the old croft lands formed upon it are of superior richness; and even outfield lands left long in pasture, with calcareous manures spread upon them, often acquire the fertility of the finest crofts.

'In the neighbourhood of Dumfries is a tract, comprehending most of the parish of Tirregles and part of Troquier and Irongray, where the soil is sandy, intermixed with loam; the surface being smooth, and the ground level. This possesses the faculties of cultivation and improvement, beyond any other parts of the country.

'Along the banks of the Nith, near its mouth, there is no inconsiderable portion of merse land. For several miles below Dumfries, the tract is narrow, and interspersed with large *flowes*; but in the lower extremity of New-Abbey and Kirkbean, it expands to much greater breadth; comprehending 5000 or 6000 acres, either of merse land, or of a rich loam, partly on a gravelly bottom, and partly on a bottom of limestone. The greatest part of this appears to have been formed by the overflowing of the river, and reflux of the tide. The soil, accordingly, exhibits a curious mixture of clay, peat, sand and shells, lying sometimes horizontally in different strata, but commonly blended together in various proportions. The sea, here, appears to be gradually receding from the land, and as it retires, forming successively, year after year, little embankments of sand, behind which it deposits its muddy contents, on the level shore. Thus, without any assistance from art, the channel of the frith is slowly contracting. There cannot be a doubt that, by a judicious embankment, much land might here be acquired; and at an expense by no means proportioned to its value. Much of this merse land being still overflowed, in very high tides, has not been brought into tillage.

'From the Nith district, above described, to the Dee, there is an extensive tract of land, comprising the parishes of Lochrutten, Kirkgunzeon, Orr, part of Kirkpatrick and Colvend, Crossmichael, Kilton, Buittle and Rerwick; which is hilly indeed, but of a smooth unbroken surface; of a strong soil, but often retentive subsoil. The greater part of this is peculiarly adapted for tillage, and becomes less valuable when left long in pasture.

'The remaining part of the arable district, possesses, in a much greater degree, all the remarkable peculiarities of the Galloway soils. Broken and abrupt in the extreme; with nearly the same proportion of arable as the above; but much less adapted for tillage, though excelled nowhere, and seldom equalled for the kindly and nutritive quality of its pastures. This account particularly applies to the parishes of Kirkcudbright, Borgue, Twynholm and Tongland. The Milton Croft, in the parish of Kirkcudbright, a farm of one hundred

hundred and thirty acres, is esteemed the finest pasture land in Galloway. Though there are some other farms, and very many spots of smaller extent, which, under the same good management, would not be much inferior in the luxuriance of their pastures.

'In the shire of Galloway, the *Machers* so much resembles the district just mentioned, as not to require a separate description. It is mostly arable; but chiefly distinguished for the excellence of its pastures; and, in this respect, it would be very difficult to determine to which of the two the superiority belongs. The lands of the Earl of Galloway, farmed by himself, the estates of Physgill, Tannerghie and Glasserton, are well known from the fine bullocks they send annually to the Norfolk markets.

'On the banks of the Cree, and along the head of Wigton bay, there is a pretty extensive tract of alluvial soil, evidently formed of substances carried down by the river, and thrown back mixed with clay, shells and sand, by the reflux of the tide. The carse of Baldoon, which forms the largest part of it, (being about 3000 acres,) has all the qualities of the merse already described, and is esteemed superior for tillage to any in the county. The valley along the Cree varies from two to four miles in breadth: and the river has evidently shifted its bed from one side of it to the other. Along the banks of the river the soil is of a strong clay; behind this is a large tract of moss; and betwixt this and the rising grounds is another large tract similar in quality to the first. The moss accumulating for a series of ages by its decayed vegetables, and heaved up by subterraneous waters, is considerably more elevated than the clayey lands on each side of it. On the bottom of the river large oak trees are found as the river shifts its bed, which had been buried to the depth of twenty-five or thirty feet; for such is the height of the banks of the river above its channel.

'This singular appearance indicates that the whole valley had once been a large forest. The river, as it changed its course, would undermine the trees, successively, from one side of the plain to the other; and being assisted by the flowing tide, would again cover them with alluvial soil, to this extraordinary depth, where for ages they have remained concealed from human view. The rising grounds to the west of the river, through the parish of Wigton, and the lower part of Penningham, are for the most part arable; and, though hilly, are of a smooth surface, strong soil, and absorbent subsoil; which is rarely the case with hills of such an appearance in the stewartry.

'In the valley which extends from the bay of Luce to Lochryan, eight or nine miles in length, and varying from three to six miles in breadth, the soil consists chiefly of a deposition of sea sand; interspersed with considerable tracts of flow-moss. These are seldom of much depth; and, resting upon a sandy bottom, often admit of being easily brought into tillage. The greatest part of this large plain, affords evident indications of having been overflowed by the sea.

sea. A stripe of sandy soil occurs also on the west side of the bay of Lochryan.

'The Rhinns, with the exception of the greatest part of the parish of Port-Patrick, is, in general, a very arable district. The hills, along the whole of this peninsula, rise to a considerable height; and seem, as if intended by nature, to form a strong barrier against the westerly winds. From a retentive subsoil, they are often also spungy and wet, particularly, on the western side of that part of the peninsula which extends along the bay of Luce. They possess all the other characters of the strong soils which have already been described. On the other extremity of the peninsula, even where the hills rise to the same height, and have a smoother surface, the subsoil is frequently absorbent, consequently they are still better adapted for tillage.

'It deserves to be mentioned, that through the whole of the arable district, both in the shire and stewartry, bogs and mosses frequently occur; though these are often of such small extent, as to detract nothing from the value of the lands. p. 8—17.

In chapter 2d, we are furnished with a full account of the state of property; from which we learn, that property is more divided in the stewartry than in other counties; and that it also has been subject to greater fluctuations. In Wigtonshire, property is more accumulated in the hands of a few great proprietors. The valued rent of the stewartry is 114,637*l.* Scots; of the county, 67,646*l.* same money; whereas the real rent, in 1808, of both, was 267,125*l.*; which is an increase of 17$\frac{6}{10}$ths to one since 1642, when the lands in Galloway were valued. This increase of value does not seem to be regular or uniform; as in some of the moor parishes, the real rent, in Sterling, seldom equals the valued rent in Scots money; whilst, in some parishes of the lower districts, it is more than double, and in some farms three or four times as much. With regard to the management of property, we are much obliged to Mr Smith for several judicious remarks.

'*Management.*—It were an invidious task to describe minutely the very different management of estates in this district. The Reporter cannot, however, forbear remarking how forcibly he has been struck, in the course of his survey, with the very different state of improvement upon estates possessing similar advantages; and which must be ascribed to the proprietors themselves, or to those entrusted with the management of their property. On some estates, the same poor accommodation of buildings, the same awkward subdivision of farms, or total want of fences and enclosures; in a word, the same wretched plans of husbandry which prevailed forty or fifty years ago, are still continued. Almost no advantage appears to have been derived from all the important discoveries and improvements of agriculture, either for ameliorating the condition of the farm,

farm, or increasing the comforts of the occupier. Where this is the case, the blame, in part, devolves upon the tenant; much of it, however, as will appear, must also attach to the proprietor.

'In the management of other estates, and perhaps the greater number, attention and judgment are displayed on the part of the proprietors, with sufficient liberality in giving encouragement to the possessors. The mere circumstance of immediate pecuniary returns does not engross the whole of their attention. The permanent improvement of their lands, the credit and comfort of their tenants and dependants, the ornament and general improvement of the country, are taken into the account.

'They are judicious in sizing and subdividing their farms; careful in the selection of their tenants; liberal in advancing money for buildings, fences, drains, manures, roads, &c.; and some of them, also, not remiss in forming plantations, which Galloway so much wants, and for which, in many places, it is peculiarly adapted.

'In many cases, the improvements in buildings are specified at the commencement of a lease, and executed by the landlord, having the tenant bound to carry the materials and keep them in repair. This is a much better practice than to grant a sum of money, which is sometimes done, leaving the application of it to the tenant. In building dikes and cutting drains, the expense is often defrayed conjunctly. The proprietor builds the dike, the tenant furnishes the stones; the proprietor cuts the drain, and the tenant fills it up, if a covered one; or, if an open one, cleans and keeps it in repair. In planting, weeding and repairing hedges, unless the proprietor take charge of the whole, which is seldom the case, they never almost come to perfection.

'At the commencement, or during the currency of a lease, the landlord often advances money for these or other improvements, and receives 5, 6, or 7½ per cent. in addition to his rent. An excellent practice, where tenants are not sufficiently opulent to undertake these expensive improvements from their own capital. On the other hand, the tenant sometimes executes certain specified improvements, on condition of being indemnified to the extent of their value at the termination of the lease. This is very apt to terminate in a litigation.

'But there are many landlords, and among these some of the most considerable in the district, who lay out no money on their farms, and whose management consists wholly in receiving their termly rents; leaving their tenants to carry on improvements by their own capital, or otherwise to provide themselves as they best can. The comparative poverty and bad cultivation of such estates, and the ultimate loss to their proprietors, must be fully apparent to every attentive observer. And the mischief is sometimes aggravated, when the management of estates is committed to gentlemen of the law as factors, a practice too general in some other parts of Scotland, but happily very rare in this district.

'The extensive division of property in Galloway, and regular gradation

gradation in the value of estates, is favourable to agricultural improvement. The small proprietor who occupies his own farm, commonly improves it with great diligence. Though nearly on a level with the common farmer, he mixes occasionally with those above him, who, in their turn, also associate with the higher orders; and all, perhaps, have their ideas enlarged from this intercourse. The portion of knowledge which one part has obtained, is soon circulated through the whole mass. And whilst subordination is preserved, the whole community is thus also better united; so that in a political, no less than economical view, such a *division* and *gradation* of property is of advantage to the commonwealth.' p. 33—36.

In chapter 3d, the husbandry of Galloway in former times is copiously explained. A small sample of that husbandry will be sufficient to satisfy our readers of the miserable state in which agriculture was then placed.

'The condition of the peasantry of Galloway, at a period not very remote, appears to have been depressed, and the state of husbandry rude and barbarous in the extreme. The facts which are subjoined, are all in the recollection of persons now living; and, were there not proper documents of their truth, the traces of them still remaining, are such as must render them sufficiently credible.

'Estates appear to have been broken down into very small farms; or, when farms were large, they were held in *common* by two, three, or even four different tenants, who divided the labour and produce in a proportion corresponding to their rent. These, when in tillage, were sometimes *run-rig*, where each had his portion allotted; sometimes the whole was ploughed, sowed, and reaped in common, and the produce divided in the field, barn, or barn-yard. Houses or sheds for the whole cattle of the farm never entered into their conceptions. Their cows were, indeed, not uncomfortably lodged: very often under the same roof with themselves, and sometimes without any intervening wall or partition. Their houses were commonly wretched dirty hovels, built with stones and mud, thatched with fern and turf; without chimnies; filled with smoke; black with soot; having low doors, and small holes for windows, with wooden shutters; or, in place of these, often stopped with turf, straw, or fragments of old clothes. They were commonly placed in low and sheltered situations; and, lest their thick mud walls, almost without any aperture to receive the air or light, should not afford them a sufficient defence against the inclemency of the weather, they usually placed some of the offices immediately in front, at a distance merely sufficient to afford them an entrance.

'Their farms were always overcropped and overstocked. Ten, twelve or fourteen horses would not have been reckoned sufficient for operations of husbandry which are now performed by two or three. Four horses were yoked a-breast to the plough. The plough team sometimes

sometimes consisted of six or eight. These were conducted by a boy. Two men besides were necessary; one to hold the plough, and another, provided with a fork, to assist in regulating the depth of the furrow. Their furrows were never drawn in parallel lines, nor was any attention given to form the ridges of an equal size. Hence a waste of seed and increase of labour.

The old Scotch plough, large and massy, but coarsely put together, was the only one then known. If their ploughs were bad, their harrows were still worse—made all of wood, and commonly very light. This was, indeed, a very necessary precaution, as they were always drawn by single horses; and these horses, at that season, were commonly so feeble and emaciated, that, with the slightest incumbrance, they were scarcely able to crawl along the coarsely ploughed lands. The teeth of their harrows were made of thorn hardened in the smoke, and were sharpened every morning. With these the fields were scratched over, and *part* of the seed was covered. The crop, however, was seldom a thin one; for as none of the couch grass or root weeds were destroyed by fallowing or green crops, these sprung up in abundance. But though the return, in harvest, of course, was bulky, only a small proportion of it consisted of grain—commonly as indifferent in quality, as it was trifling in quantity.' 33—40.

Again, when detailing the progress of improvement, Mr Smith says:

'When the Union had opened an unrestrained market for lean cattle in England, the gentlemen of the country seem to have perceived the possibility of deriving a better income from their lands. Grass, which had before been an object of no value, and was considered in no other light than as a fallow to enable the lands afterwards to produce some oat crops, now became valuable on its own account: and cattle were the chief source from which gentlemen might expect a revenue. They, therefore, exerted themselves to improve their pasture lands. By a variation in the mode of cropping only, or with much less violent innovations than were actually attempted, it is probable that this object might have been obtained, and the crops at the same time much improved. But the improvements of husbandry were then altogether unknown; and, perhaps, there was not a single individual in Galloway who had found out the important secret of cropping a farm constantly, and keeping it still in good order, and always productive. The palpable superiority of the herbage about gentlemens' houses, kept constantly in grass, for the accommodation of their families, could not fail to strike them with conviction, that it would be for their interest to keep a smaller portion of their lands in tillage. By the improved market for cattle, such lands yielded them considerable profit; whilst lands equally adapted for tillage afforded but a scanty subsistence to tenants, and scarcely any overplus for rent. Their object, therefore, was to in-

crease the quantity of the grass; and to attain this, they knew of no other means, than to give the land a longer respite from tillage, either by throwing farms wholly into grass, or, at least, by cropping them to a much less extent. About the year 1715, or 1720, it appears to have been the intention of most landlords to reduce the tillage from one-half to one-third, and, in some cases, to one fourth of the arable land. This violent innovation created a dreadful alarm among the tenantry and all the lower orders. It was not easy to persuade men universally attached to long established opinions, confirmed by invariable practice, that it was possible to produce more corn from one-third or one-fourth, than from one-half of their arable lands. To satisfy the tenants, whilst under the influence of these prejudices, it was necessary to give them as much land for corn as before; which could only be done by increasing the size of their farms; and, of course, throwing several into one. Improvements, thus carried on by turning many people out of their farms, excited a general odium; which was greatly increased by the ill-judged precipitation of the gentlemen in ejecting too many at one time, and without affording them any other resources of occupation, or means of subsistence. The animosities occasioned by this measure arose to such a height, that, in 1720, an insurrection actually took place; and the peasantry, in the lower parts of Galloway, assembled in parties of several hundreds, throwing down the stone dykes which had been built for enclosures, without, however, attempting any other violence. From this circumstance they got the name of *levellers*; and the disturbance is still spoken of in the country by the name of *levelling*. After the suppression of it, a number of people are said to have left the country. This is assigned as the cause of the thin population of Galloway; which, however independent of the circumstance of this insurrection, may be accounted for from the system of grazing, too precipitately then introduced. Enclosing afterwards meeting with no opposition, went on rapidly; and grazing has ever since been a favourite object with the farmers and landholders of Galloway. Every where, except in a very small district, the interests of agriculture have been subordinate to the attention given to cattle; and, till a very recent period, the improvements in husbandry have not corresponded with the general progress of knowledge.' p. 43—45.

After describing the improvements of Mr Craik, as mentioned in our last Number, Mr Smith enters upon those of a most amiable and patriotic young Nobleman, who, unfortunately for his country, was removed from the stage of life at an early period. So much justice is done to the character of that excellent personage, that we cannot refrain from laying before our readers what Mr Smith says concerning him. Indeed, Lord Daer may be considered as one who rather acted for the public, than for himself, on most occasions.

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'For some time after the termination of the American war, the spirit of improvement was quite dormant. On observing it beginning to revive, about the year 1786, the late Earl of Selkirk, who had very enlightened views with regard to rural œconomy, became extremely desirous of effecting various improvements upon his estates, both in the shire and stewartry. He was then, however, too far advanced in life to engage personally in the business: and, as the best means of attaining the object in view, he, by an act of generous confidence, transferred the whole management of his estates to his son, the late Basil William, Lord Daer.

'The talents of this young nobleman were of the highest order, and the ardour with which he turned his powerful mind to the investigation of every subject connected with rural œconomy, was only equalled by the perseverance and ability which he displayed in the practical execution of his plans. In the management of his father's estates he set an example of enlightened liberality; and his influence was most zealously exerted in promoting every public measure of utility. Roads and bridges, as the great groundwork of other improvements, were early the objects of his most anxious attention. The unexampled success with which he applied himself to this branch of rural œconomy, and the spirit and judgment which he displayed with regard to farm houses, and useful and ornamental plantations, will fully appear in the sequel.

'In carrying forward his bold and decisive plans of rural improvement, he had to encounter much opposition: his views were sometimes mistaken, and his motives misrepresented: every difficulty, however, served only to increase his ardour, and he had at last the satisfaction of seeing the mists of prejudice beginning to vanish before him. But, alas! while indulging in patriotic anticipations, a mortal disease had taken root in his constitution. Having been seized with symptoms of pulmonary consumption in the course of the preceding year, he fell a victim to that fatal malady on the 5th of November 1794, at the early age of thirty.

'Any attempt to delineate the general character of this lamented nobleman, or to describe the universal sorrow which, on his death, pervaded all ranks in the district, would be here out of place; but it is proper to remark, that the period during which he managed his father's estates, must ever be held a most important epoch in the history of the rural economy of Galloway. Fortunately for that district, his plans have been followed out with great ability and success, by his brother the present Earl of Selkirk.' p. 53, 54.

When describing farm-houses and offices, Mr Smith again notices the meritorious conduct of Lord Daer. He there states, that,

'Among the buildings for the accommodation of farmers, there is, in this district, the greatest possible diversity. Whilst some of them continue nearly in the same wretched state in which they were

at the middle of last century, many are now constructed in a style of elegance and convenience, seldom surpassed in any other part of the united kingdom. In no place has improvement, notwithstanding many discouragements, advanced with greater rapidity. Basil William Lord Daer was the first who set the example; and gave, as it were, a new direction to the ideas of the gentlemen of the county on this and other important articles of rural economy. He began his operations on his father's estate in the year 1786. Prior to this period, some others had indeed done a little, but not enough to make any impression on the public mind, or even ascertain what the real advantage of such improvements ultimately might be. The farms on this estate, though considerably different in their extent, are generally, however, of a proper size; and almost every tenant is accommodated with a good dwelling-house, and a complete set of offices. The dwelling-house commonly consists of two stories, and always of four, five, or six apartments. Barns, stables, cow-houses and sheds are provided, suitable to the size of the farms, all on very judicious plans; built with stone and lime, and covered with good slates. Almost every farm has also a good thrashing machine, driven by water, or wrought with horses.' p. 57, 58.

The size of farms in Galloway, as in every other district, differs exceedingly. In the moors they are large; some even reach to 10 or 12 square miles. In the cultivated parts, some consist of 500 acres; though 200 acres may be something like the average size. In the shire, farms are generally smaller than in the stewartry, whether used for pasturage or corn husbandry. Some of the moor farms are set below 6d. per acre; while arable land, in one instance, is rented at 4 guineas; though the average of the whole of what is arable, is considered by the reporter as not exceeding 17s. or 18s. per acre.

From the sixth chapter it appears, that nearly the whole of Galloway is enclosed; though in many places the fences have been superficially made, and not calculated for sheep husbandry. Some excellent directions are given with regard to the building of stone-walls (called by the reporter, dikes), though we have not room for them. The Galloway cape upon a well built stone-wall, is known to be unassailable by stock of any kind, if the wall is built five, or even four and a half feet in height before the cape is constructed. Even the Nimrods, or hunters, are afraid of trying their powers upon a fence finished in that manner.

The farm implements of Galloway seem to be much the same with those used in other districts; therefore call for no particular notice. It deserves, however, to be mentioned, that an ingenious mechanic resides at Castle-Douglas, by whom farm implements of every description are constructed in the most satisfactory manner. We expected Mr Smith would have given some account

account of his attempt to make a reaping machine; but in that expectation are disappointed. Though unsuccessful, much praise is due to him for attempting to construct such a machine, especially as it was of a kind which promised to be of the greatest benefit to every husbandman.

There is not any thing in the chapter upon arable husbandry which attracts our attention, except the small quantity of oats mentioned by Mr Smith as consumed by farm horses. His words are, 'The quantity of oats consumed by a work-horse, varies 'from 15 to 25 bushels, if good oats are given; but as draughts '(light corn) are commonly given, the quantity is proportion-'ably increased.' Now, if the meaning of Mr Smith is, that a work horse gets no more than the largest of the above quantities in *one year*, either he is in a mistake, or the horse must be so badly fed as to be unfit for work. Let us see how many feeds there are in 25 bushels; and what time that quantity will serve a working horse that is regularly employed either in plough or cart. A bushel of oats will furnish seven feeds, (and that is the most we could ever make out of it; or, which is the same thing, ten and a half out of the Linlithgow firlot); therefore, 25 bushels will exactly feed a horse 175 times. Now, as there are 243 days from the 1st of October to the end of May, we are at a loss to ascertain how the horse can be fed daily during that period;—far less able to understand how he is to be fed in the middle of the day, during seed-time, when two yokings are taken, which will at least extend to a period of 90 days. In this way, 333 feeds seem to be required, independent of the evening feed of potatoes, though the supply is only 175; and were the *forpet* of an Edinburgh stabler even to be used, that number of feeds would not be numbered out of 25 bushels. But if these remarks are just when applied to the largest quantity, in what terms should we animadvert upon the other, viz 15 bushels? Surely Mr Smith has either been grossly misinformed, with regard to the corn consumed by a working horse; or, if he has not been misinformed, it follows of course, that horses in Galloway are not regularly employed as they are in other districts.

In our own case, though not disposed to waste corn more than other people, we find, from the experience of many years, that not less than 16, oftener 18 bolls of oats, are required to feed each horse employed, for 12 months. Now, as 16 bolls (the smallest quantity) is about 96 bushels, our readers are left to judge, whether or not horses are fed in such a way in Galloway, as to enable them to plough the ground either in a sufficient manner, or to execute the quantity of work that a man and a pair of horses are capable of performing, when sufficiently supplied with

food. No doubt, if potatoes are given as an evening *feed*, less corn may be necessary; though, even with potatoes, not less than 10 bolls, or 60 bushels, will be required, where horses are worked in the East-Lothian manner. Our custom is, to feed once a-day with oats during the whole season, except in the harvest month; three times per day during wheat-seed time, which usually last two months; twice a-day during the winter months; three times per day from the 1st of March to the 1st of July, when turnip work is over; and twice per day till the summer-fallows are dunged. In short, we never could perceive the thrift of scrimping working horses of corn; it being quite plain, that, if the horses are not in good condition, either the quantity or quality of the work must be affected, or the stock be reduced.

The estimate of the expense of keeping a working horse, is subject to the same kind of remarks as those already made. To speak of keeping a working horse for 12 months at 13*l.*, is out of all character. If he consumes 25 bushels of oats, as *moderately* stated by Mr Smith, the value of these oats, even at the very low price of 2s. 6d. per bushel, exceeds the sum stated for both oats and potatoes. If only half a peck of potatoes is given each night (and this is a sober feed to a working horse), this, of itself, would amount to seven bolls and a half, from the 1st of October to the end of May; and if we shall suppose the value of these potatoes to be no more than 5s. per boll (and below that price they cannot be raised without loss), the expense of the evening feed would not be less than 1*l.* 17s. 6d.; which sum, added to the value of the oats, even supposing that 25 bushels were only used, would amount to 5*l.*, instead of 3*l.*, as stated by Mr Smith. Were it not disagreeable to continue these animadversions, we would show that the sum stated for grass is equally underrated.

In the section upon barley culture, Mr Smith states, that bear, or *big*, is now almost exclusively confined to moor farms; whereas, we have been informed by a respectable friend in Wigtonshire, that barley will not succeed in the western district called the Rhins, where *big* continues almost to be universally sown. Very likely, this is owing to the difference of climate, arising from the vicinity of the Irish Channel and Atlantic Ocean; but whatever is the cause, the fact is as we have stated.

The section which treats of turnips contains many useful remarks; and were they attended to, we are quite clear that the husbandmen of Galloway would be greatly benefited. In a district where so many cattle are annually reared, it is physically impossible to preserve young stock in good condition during the winter, and particularly in the spring months, without having a full supply of that valuable esculent. It is objected, that turnips

are

are long consumed before the grass season arrives;—an objection more specious than solid; for, were the Galloway farmers to raise yellow turnips, and ruta baga, they could not be under the slightest difficulty of carrying on live stock in good condition till a supply of grass was received. We suppose there is too much truth in what Mr Smith says, viz. that the culture of turnips is more *talked* of, than diligently and successfully practised.

The chapter upon orchards is a very short one. Indeed, we felt some surprise when the Board of Agriculture devoted a branch of every report to such a subject;—a subject not only unconnected with husbandry, but one altogether irrelevant to the state of Scotland, some few particular situations excepted.

It appears that considerable attention is paid to the management of wood land; and that, though the district contains no large forests, yet that the woods and plantations within its bounds are of considerable extent. A short extract will explain these circumstances.

'The plantations on the estate of the Earl of Stair are not extensive. It would be unpardonable, however, not to notice those around Castle-Kennedy. The beautiful and picturesque scenery of this delightful spot cannot fail to strike the most inattentive observer. The smooth lawns, sweet glades and vistas opening a variety of striking views,—the fine lake, with its islands and peninsulas, and the sloping banks, curiously modelled by art according to the taste of the times, it would be foreign to our purpose to describe. Many of the trees are of a most luxuriant growth; and the beech hedges, seventy feet high, are not excelled perhaps by any in the kingdom. These were chiefly executed about the beginning of last century, by John, Earl of Stair, distinguished for his talents as a statesman, and for his exertions in promoting the union of the two kingdoms. They were afterwards much improved by his son and successor, the celebrated Marshal Stair, and are kept in good order by the present Earl.

'Among the plantations of the district, those of the Earl of Galloway deserve particular notice. Around his beautiful seat the pleasure grounds are very extensive, and the plantations in clumps and belts, are continued on the rising grounds along the coast of Wigton bay, to the distance of several miles. These, with the other plantations on his Lordship's estate, amount to upwards of five hundred acres. All were executed during the life of the late Earl. They add much to the beauty of this fine part of the country, which had before very few vestiges of planting.

'The plantations of the Earl of Selkirk are more extensive. They cover upwards of eight hundred Scotch acres, and are so finely diversified, as to convey the idea of a still greater extent. The general plan upon which they are laid out, was formed, and the execution of them begun, by the late Earl, about thirty-five years ago.

To his lordship's taste they do great honour. Although designed at a period, when the public taste in matters of this kind, was far less fastidious than at present, it may safely be asserted, that they will bear to be tried by the principles even of Mr Price.

'The late Earl had executed only a small part of the plan, when, in the year 1786, he transferred the management of his estate to his son, Lord Daer, who immediately made the most judicious arrangements for carrying on this branch of his improvements. The estate was most accurately surveyed, and all the ground intended to be planted marked out. Perceiving that many advantages would arise from raising the plants upon the spot, he formed a nursery of about twenty acres, which was very speedily stocked with plants suited to the soil and climate. A portion of the ground previously marked out, varying in extent according to circumstances, was then enclosed and planted annually; beginning with the grounds most contiguous to St Mary's Isle, and gradually extending to the remoter parts of the estate. This mode of proceeding has been steadily pursued for upwards of twenty years, and the plan has been now nearly completed by the present Earl.' p. 175—177.

An interesting statement is given by Alexander Maclean, Esq. of the different methods he had adopted for improving moor and moss land, which cannot without injury be separated. On that account we shall endeavour, in next Number, to present the whole of it. The account of Colonel M'Dowal's improvements, at Mull of Logan (a valuable communication by our friend Mr Shank) shall also be reserved.

Paring and *burning* are not much practised in Scotland, chiefly owing to the lateness and wetness of the climate; therefore we are happy to observe some useful information from Mr Smith, concerning the way in which these practices are executed in Galloway.

'Paring of mosses is performed with the common spade rounded in the mouth, and sharpened from time to time. A flaying or paring spade, provincially termed a *flaughter*, or in England push plough, is sometimes used, which performs the work more expeditiously. This is made of steel in the mouth, which is not much thicker than the blade of a common scythe—about eight or nine inches broad by three or four—the neck into which the shaft is fixed from two to four inches broad, bent a little upwards, and of sufficient strength to bear the pressure in raising the turf. It is provided with a shaft four feet long. Sometimes the shaft is six or seven feet long, when the bend of the neck is made less, as in working it runs more nearly parallel to the surface of the ground. It is also furnished with a small turned-up wing on one side of the mouth, which cuts the turf like the coulter of a plough. The parer is provided with greaves or plates of wood, by which he is enabled to give a stronger impulse to the spade.

'But

'But the lands in which paring and burning have been practised with the greatest advantage, are such as consist of *peat* mixed with alluvial soil, or common earth. Bogs of this description are common in every part of the district, and some of them are of considerable extent. They vary much in depth; the soil is commonly retentive, and, in its natural state, very unproductive. When, however, it is broken and pulverized, it becomes extremely fertile, and bears cropping better than almost any other. From its extreme tenacity, to effect this by liming and fallowing, would be attended with great expense. Paring and burning is found to answer the purpose; and as the ashes are always copious, they afford sufficient manure for two or three successive crops. Where the subsoil is good, or the quantity of peat upon it considerable, the lands can never be injured by burning, as enough will remain for other manures to act upon, when the virtues of the peat ashes are exhausted.

'The first instance that has come to our knowledge, in which paring and burning has been practised to a considerable extent on such lands, was on the estate of Sir Alexander Gordon, on a farm which he banked from the river Dee.

'The bog being divided into fields of three or four acres by ditches, which served the purpose of enclosing as well as draining, became so firm as to admit of being ploughed in dry weather. The furrows were then cut into proper lengths, and a short time after built into kilns, and set on fire. When reduced to ashes, these were immediately scattered, and ploughed down as soon as convenient: and the land thus treated produced luxuriant crops of oats, which were repeated several years apparently without any diminution.

'The crops of oats and barley are stated to be superior to those upon the dry lands in the farm, both in quantity and quality. The turnip and potatoe crops cultivated afterwards, were also luxuriant; and the hay on one field of four acres, sown with clover and rye-grass, amounted to 1000 stones, of 28 pounds avoirdupois.

'The expenses per acre for ploughing, paring and burning and scattering the ashes, is reckoned at - - - L.1 1
Per acre of draining - - - - - - 2 0
A very moderate computation: but since that time the price of labour has been doubled.

'Sir Alexander Gordon began this improvement from observing the method practised in Berkshire.

'Mr Cathcart of Genoch has this season practised burning on a pretty large field, of a soil very similar to that which has been described; the bottom clay and sand, and the quantity of earth mixed with the peat very considerable. After ploughing, the furrows, when sufficiently dried, were burnt as they lay on the field, without being built into kilns, or collected into heaps. He proposed sowing it with rape seed, a species of crop which has been very little, if at all, attempted in Galloway.' p. 224—227.

Breeding

Breeding and rearing of cattle may be considered as the staple trade of Galloway. Hence, a full account of a breed of cattle peculiar to that district, became an object of importance with the person employed to report upon the husbandry of the district. This duty has been successfully discharged by Mr Smith; though, as the section which treats of cattle is a long one, we can only lay before our readers his description of a true Galloway bullock.

'The following are the characters of a true Galloway bullock. He is straight and broad in the back, and nearly level from the head to the rump, closely compacted between the shoulder and ribs, and also betwixt the ribs and the loins—broad at the loins, not, however, with hooked bones or projecting knobs; so that when viewed above, the whole body appears beautifully rounded, like the longitudinal section of a roller. He is long in the quarters, but not broad in the twist. He is deep in the chest, short in the leg, and moderately fine in the bone—clean in the chop and in the neck. His head is of a moderate size, with large rough ears, and full, but not prominent eyes, or heavy eyebrows; so that he has a calm, though determined look. His well-proportioned form is clothed with a loose and mellow skin, adorned with long soft glossy hair.' p. 236.

The dairy system seems to be on the increase; though it is dreaded, that the rearing of cattle may thereby be materially injured. Besides a variety of small dairies, two or three on a large scale have lately been established in the county of Wigton, by farmers from Ayrshire, whose returns are understood to be much above the ordinary profits arising from the breeding and rearing of cattle. The returns from the dairy are also more certain and immediate, than those from breeding and rearing cattle; matters of great importance to those interested in them.

Sheep husbandry is extensively carried on in Galloway, both soil and climate being highly favourable to it. In the lower and arable parts, the quantity kept is comparatively small; but, in the moorish and mountainous parts, sheep husbandry has long been pursued with unremitting attention. The improved breeds from England seem to have been strangely mismanaged and neglected, being seldom preserved pure, or crossed with judgment. Hence, in most cases, the slight admixture of better blood is now quite imperceptible in the general mass. The black-faced breed, however, have been long in possession of the Galloway mountains, and are considered by all the principal storemasters as superior to every other. Some trials of the Cheviot breed have been made; but the result has by no means been favourable. This to us seems a surprising circumstance; as the climate of Galloway, from its mildness in winter, may be considered, to be much better calculated for Cheviot sheep than the hills of Ross-shire and Sutherland,

land, where for many years this breed has been kept in great numbers, with much advantage.

The number of swine in the district is considerable, chiefly owing to the great quantity of potatoes that are cultivated. The surveyor estimates the number of swine at 10,000; which is a wonderful circumstance in a district where, 100 years ago, these animals were not known. Here we may make a slight allusion to a treatise lately published on the management of swine, by Mr Henderson at Broomhill, near Annan, which contains a good deal of useful information. That treatise was meant to be reviewed in this Number, had not our pages been previously occupied. In next Number it shall be noticed. Meantime, it may be stated, upon the authority of a Wigtonshire friend, that not more than one-third of the swine fed in Galloway are consumed within its bounds, as a very considerable number are slaughtered, and exported from Stranraer and Glenluce; at which places, of late years, much bacon has been cured.

The section upon roads is ably executed; and with an extract from it our examination shall be concluded. To the planning, making and repairing the turnpike and parochial roads, the gentlemen in Galloway seem of late years to have paid very great attention. They slumbered for a long while, to be sure; but, by their present activity, appear determined to make up for the negligence and inattention of former times.

'After the conversion of the statute-labour had produced a regular fund for the purpose, exertions were made, in many parts of the country, for repairing the roads in a substantial manner; and, in some instances, for conducting them in a more convenient direction. But the first attempts of this kind were carried on in a very injudicious manner: no systematic plan was adhered to; and, the most trifling objects of individual interest, were often allowed to obstruct important improvements. Fortunately for the country, an example of more liberal and enlightened management was given, before the work of renewing the roads had made very great progress. Basil William, Lord Daer, as has been already mentioned, had early turned his attention to this important branch of rural economy. He perceived the essential consequence of good roads as a preliminary step to every species of agricultural improvement; and saw that the expense of making them anew in the most convenient directions, though very considerable, would be speedily and amply repaid by the advanced value of the farms, which would thereby obtain the benefit of a cheap and easy conveyance for manures and for the produce of the land. He was well acquainted with the valuable improvements which had been suggested on this subject by Sir George Clerk of Pennycuick, the first man in Scotland who appears to have conceived the idea of conducting roads through hilly and mountainous districts, with a systematic attention to the most level direction. Lord Daer's mind

mind was of too comprehenſive a caſt, not to perceive the full importance of this ſuggeſtion; and the extreme difference, for the purpoſes of agricultural accommodation, between a level road, and one made along the old ſteep and inconvenient tracks, however ſubſtantially executed. He alſo diſcovered, from attentive obſervation, that, notwithſtanding the very uneven ſurface of this diſtrict, a ſmall ſacrifice in reſpect of diſtance would, in every inſtance, render it practicable to avoid any very ſteep aſcent: in many inſtances, he found that great eminences might be avoided without any increaſe of diſtance whatever. In carrying theſe principles into execution, Lord Daer met with much obſtruction from the prejudices and contracted views of many of the country gentlemen, whoſe concurrence was neceſſary for effecting his plans. The Earl of Selkirk, however, repoſing entire confidence in the judgment of his ſon, entered warmly into his views, and placed at his diſpoſal adequate funds for carrying them into effect, ſo far as his own property extended. Fortunately the eſtates, of which Lord Daer had thus the management, were of ſufficient extent to afford conſiderable ſcope for theſe improvements, without interfering with the lands of other proprietors who might not be diſpoſed to promote them. His firſt operations, therefore, were confined to his paternal property; upon which he planned a completely new ſet of roads. By attentively combining the different objects required for the accommodation of the whole eſtate, it was found, that the old and uſeleſs tracks, which might be relinquiſhed, exceeded in extent the new lines which it was neceſſary to make; and that thus, notwithſtanding the great expenſe of making the new roads, a ſaving would ultimately be obtained, by the diminiſhed annual expenſe of repairing them.

'The plans thus deviſed by Lord Daer, were too extenſive to be effected at once; but he proceeded in a progreſſive manner, executing a proportion every year; and this ſyſtem has been followed out by his ſucceſſors, till the whole is now nearly completed. In no part of the kingdom, perhaps, can a property of the ſame extent be found more completely accommodated in this reſpect. So entire a change as that which Lord Daer deviſed, involved undoubtedly a conſiderable direct expenſe, beſides the incidental inconvenience of occupying good land, and deranging enclоſures, by which new fences became requiſite. Theſe circumſtances, to a mind of leſs liberality, might have appeared a deciſive objection to the plan. They did not eſcape Lord Daer's attention; but he had ſatisfied himſelf by accurate calculation; and the reſult has clearly proved, that theſe drawbacks, though of no trifling moment, did not deſerve to be placed in competition with the important improvement to which they were ſubſervient.

'In planning the new roads which he judged neceſſary, Lord Daer had no aſſiſtance, but that of a ſurveyor inſtructed by himſelf. He was of neceſſity his own engineer; for the profeſſion of a road engineer, which is now in high eſtimation in Scotland, was then unknown. It is, perhaps, in ſome degree, from his exertions, that ſuch a profeſſion has originated. Adopting the general principles ſuggeſted by Sir George Clerk,

Clerk, he had to apply them in circumstances of much greater difficulty, in a country more broken, uneven, and intricate. In many places the natural obstacles were so great, that to devise a level track, seemed to be a task beyond the utmost efforts of ingenuity. In some of these difficult situations, the methods which had been followed by Sir George Clerk were found insufficient; and after trying various other contrivances, Lord Daer was led to devise the application of the spirit level to the laying out of roads. The superior precision of the lines laid out by this method was very evident; and this valuable improvement has since been adopted by all the eminent road engineers in Scotland.

'Lord Daer's improvements on the roads in his paternal property had been carried to a considerable extent, before he could prevail on his neighbours to concur in making any great public road on the same principles. A few of the more liberal, early joined in recommending them; but the prejudices of the majority were so confirmed, that to combat them seemed to be a hopeless task. It was not till a short time before Lord Daer's death, that he could obtain their concurrence to execute a few miles of a public road in a distant part of the country, according to the plan he suggested: nor was this obtained without some pecuniary sacrifice on his part. The experiment, however, was of great consequence; the marked contrast between the road made under his direction, and the rest of the line, served (more than any thing which had hitherto occurred) to open the eyes of the country at large to the benefit of level roads, and the practicability of making them among the wildest mountains of Galloway. About this time, the surprising improvements effected by the use of lime, in the interior parts of the country, had excited a very eager desire for the improvement of roads. It became obvious, that the assessment imposed in lieu of statute-labour was insufficient, even for the parochial or interior roads; and that the principal lines of road for opening the general communications through the country, could not be improved, or supported, without the aid of tolls; yet the different views and prejudices of proprietors were such, that though Lord Daer first brought forward the draught of an act of Parliament in 1792, to double the rate of conversion, to establish tolls on the great thoroughfare roads, and to introduce a new system of road-making; it was not till the year 1796 that the bill went to Parliament, with the concurrence of the county.

'One of the first works of the commissioners under this new act, was to make an entirely new road in lieu of the military road from Dumfries to Castle-Douglas. It was a fortunate circumstance (and perhaps not entirely fortuitous), that the line adopted for this road, lay for many miles through a moorish country, almost destitute of cultivation. There was scarcely the vestige of an old road, to mislead the judgment of those who had to lay out the new line; and the proprietors of the lands adjoining, had the prospect of so great an increase in the value of their property, that few of them were disposed to give much obstruction to the making of the road in any line most advantageous to the public. A landsurveyor, who had been

been instructed under Lord Daer, was employed to lay it out; and a line, which the chain and the level had proved to be the best, was adopted without modification. A whole stage was thus executed upon new and accurate principles. Its striking superiority to all the old roads in the county, and in particular to that for which it was substituted, fully demonstrated the justness of the views upon which it was planned, and finally dissipated the prejudices which had so long prevailed upon the subject. All the roads which have since been executed in the stewartry of Kirkcudbright, have been planned upon the same principles; and these are now so generally understood, and so well appreciated, that there is little probability that any new road in the county can now be carried in a very bad direction. The improvements thus effected in the stewartry of Kirkcudbright, have excited a due attention on the part of many gentlemen in the adjoining counties; and in Wigtonshire, considerable progress has already been made in renewing the principal roads in level directions. Many of the roads in both counties, long since recommended by Lord Daer, and neglected as chimerical, have now been executed upon his plans with universal approbation.' p. 313—318.

Upon the whole, the survey of Galloway may be regarded as a most respectable performance, and as well calculated to throw much light upon the husbandry of that distant district. The author seldom loses sight of his subject, or wanders in search of delusive theories. He details the practice of the district with judgment and precision; and delivers his sentiments on every occasion in a manly and candid manner. In one or two things we have ventured to dissent from what he urged;—we allude to the remarks offered upon the expense of supporting a working horse through the year. Had our limits allowed us to examine the tables given in the Appendix, we meant also to have noticed those which give the abstract produce from stock in the shire and the stewartry. The articles in these tables, p. 386, in the way each table is entitled, would lead a stranger to suppose, that the enormous sum of 1,075,385*l.* was *annually* produced from the live stock of Galloway; whereas, it is evident, that the above sum is the total value of live-stock kept in the district, not of the annual disposeable produce. At the same time, we are quite satisfied that the author did not mean to say that the 'produce from stock' amounted to a million and upwards per annum; because it is stated, p. 388, that the total amount of agricultural produce in Galloway was no more than 614,825*l.* 2s. These, however, are venial errors, and take little away from the merits of this valuable survey. N.

Treatise

Treatise on Agriculture and Rural Affairs. By ROBERT BROWN, Farmer at Markle, in the County of Haddington. 2 vol. 8vo. Oliphant, Waugh & Innes, and Constable & Co. Edinburgh. Longman, Hurst, Rees, Orme & Brown, London.

(Continued from page 262.)

FROM considerations, such as those formerly alluded to, we refrain from giving any opinion concerning the way and manner in which this work is executed; and shall content ourselves with a brief analysis of the several chapters and sections into which the work is divided; adding a few extracts, so as the subjects therein treated of may be explained to our readers.

We have already gone through the seven chapters of the work which form the first, and now come to the second volume. The eighth chapter is divided into four sections, viz. 1. On rotation of crops, wherein ten rotations, or courses of cropping, applicable to different soils and climates, are described—(this section, by mistake, is included in the first volume);—2. On the cultivation of culmiferous crops, such as wheat, barley, oats and rye; 3. On the cultivation of leguminous crops, such as beans, peas, tares, potatoes, turnips of several varieties, cabbages, carrots, lucerne, &c.; 4. On crops used in manufactures, such as hemp, flax, and hops. On most of these subjects, particularly on the culture of wheat, beans, and turnips, the author insists, at great length, upon the several branches of process belonging to them. Speaking of beans, the following opinion concerning the cleaning process is delivered.

'In treating of the cleaning process, without noticing farther the various ways in which it is executed, we shall confine ourselves to the one which we have found most suited to the generality of bean soils. About ten or twelve days after the young plants have appeared above the surface, enter with the scraper, and loosen any weeds that may have vegetated. At this time, the wings or cutters of the implement ought to be particularly sharp, so that the scraper may not run too deep, and throw the earth upon the plants. In about ten days after the ground is scraped, according to the state of the weather, and other circumstances, use the small swing plough to lay the earth away from the sides of the rows; and, in doing so, go as near to the plants as possible, taking care, at the same time, not to loosen their roots. If any weeds stand in the rows, pull them out with the hand; afterwards earth up the plants with the small swing plough, or run the scraper in the intervals, as may seem expedient. Both ways are eligible; but, when properly earthed up, some people are of opinion that the plants are nourished by the operation; while others think that the benefit gained in that way is counterbalanced by the extra trouble attendant upon cutting the crop,

crop, the bottom being necessarily more unequal than when the scraper is employed to conclude the cleaning process.' 62, 63.

The author seems to entertain a high opinion of Ruta baga, or Swedish turnips; as, when treating of that valuable article, he expresses himself in the following terms.

'*Ruta Baga, or Swedish Turnip.*—This is another article of great importance to the farmer, affording green food of the choicest quality, highly relished by every kind of stock, and of incomparable advantage in a late season, when either cattle or sheep are to be carried on for a market, or till a supply of grass can be procured. Indeed, to procure such an article of green food, whereby stock could be supported between the turnip and grass seasons, was long a desideratum with the husbandman. This desirable object is completely gained by the introduction of yellow turnips and ruta baga; either of these roots being admirably calculated for filling up that blank in the year which farmers formerly looked to with so much anxiety. The process of management is precisely the same as that of turnips, with this addition, that more dung is required, and that the seed ought to be sown three or four weeks earlier. Rich soil, however, is required for this article; for it will not grow to any size worth while on soils of middling quality, whatever quantity of dung may be applied.

'Ruta baga is also of great advantage in the feeding of horses, either raw or boiled, or with broken corn. If a sufficient quantity were cultivated, a great deal of grain might be saved, while the health and condition of the working stock would be invigorated and augmented. An evening feed of this nutritious article would be of incalculable benefit; even the most of horses are fond of common turnip in a raw state; and it is a subject well worthy of every farmer's attention, whether it would not be for his interest to raise these esculents in such a quantity as to serve them during the long period when grass cannot be obtained. That the health of the animals would thereby be benefited, is unquestionable; and perhaps the saving of grain would greatly exceed the trouble occasioned by furnishing a daily supply of these roots.

'Every farmer, who wishes to have any of the varieties of turnip of a right kind, ought either to save seed for himself, or procure it from some neighbour, upon whose attention he can depend. It is unnecessary to expect pure seed from the shops, unless an attention is bestowed in the rearing and winning processes, exceeding what is usually given by those concerned in these processes. Hence heavy losses are often sustained by cultivators who trust to these agents; and this has been the case particularly with ruta baga. A few years ago, this excellent root was nearly given up by many farmers, because a spurious seed was furnished by the shops. However, by the attention of some respectable agriculturists, seed of a better kind has again been obtained, which may restore the credit of this valuable root. This credit, however, is only to be preserved by

by a continuance of the sedulity which caused its renovation; or, in other words, by keeping ruta baga at a distance from every other variety of the turnip and cabbage tribes, when forming its flowers, and procreating its successors.' p. 98—101.

The ninth chapter, on Grass Husbandry, is also divided into four sections. 1. On the kinds of grass most proper for cutting; 2. On the methods of consuming cut grass; 3. Of grass consumed in the way of pasturage; 4. On the most proper way of breaking up old grass land by the plough, and managing it afterwards. The introduction, or leading part of this chapter, shall be extracted.

'If the introduction of turnips occasioned a revolution in the rural arts of Britain, that of artificial grasses produced a change of no less importance at an earlier period. It is difficult to fix upon the time when clover, and other artificial grasses, were introduced into this island; though it may reasonably be inferred that the period was during the reign of Queen Elisabeth, when the nation had almost a constant and regular intercourse with Holland and the provinces of the Netherlands; at least, we are certain that, during the Protectorate, when Blythe published his Treatise on Agriculture, artificial grasses were well known in England. Many years, however, elapsed before they travelled northward to Scotland, such articles being hardly known by the husbandmen of that country when the two nations were united into one empire; nay, it is not more than forty years since they came to be generally used; though, at this time, they are sown in greater quantities by the farmers of Scotland than by those in the neighbouring country.

'It is not difficult to account for the predilection of Scottish farmers for artificial grasses. The alternate husbandry is more sedulously followed out by them than by the great body of farmers in England. Comparatively speaking, there is a small quantity of old pasture or meadow land in Scotland; whereas, in England, immense tracks of old grass are to be found almost in every district. Besides, the soil and climate of Scotland require that grasses be often renovated, otherwise the produce, in most cases, is regularly lessened, in proportion to the age of the particular grasses cultivated. These things, duly considered, will account for the strong predilection shown by Scottish farmers for artificial grasses, and why alternate husbandry is more assiduously exercised by them than by English husbandmen.' p. 155, 156.

In the third section, viz. of grass consumed in the way of pasturage, the following observations are given.

'We are friends to alternate husbandry, and therefore hostile to every scheme calculated to keep land in grass constantly, or for any period comparatively long. A few old pastures may be useful for particular purposes; but, generally speaking, none should exceed the age of five or six years, in a country like Great Britain, where

bread-corn is so much in demand, and where a return of value is generally obtained sufficient to defray the expenses incurred by alternate husbandry. Perhaps, in many cases, one year in grass is sufficient for every useful purpose; and we are almost certain that this system, upon a good soil, is the most profitable one that can be adopted when discretionary management is permitted. There are many soils, however, which require to be longer grazed, not on account of the profit obtained by allowing them to remain in that state, but entirely because they will not pay for ploughing, unless freshened and invigorated by grass. The most suitable way of accomplishing these objects is to understock; for the extent of improvement by grass, upon such soils as those alluded to, is regulated entirely by the way in which they are depastured. If eaten bare, and left exposed to a hot sun, or a scourging wind, the roots of the plants are enfeebled, and prevented from flourishing, whilst the surface, deprived of a cover whereby it may be warmed and fructified, continues equally barren and unproductive as when the grasses were originally sown. Another evil of overstocking such soils, and that not a trifling one, is that, whenever artificial grasses become languid and feeble, their place is supplied by the aboriginal inhabitants. Moorfog, that bane of grass upon thin soils, is sure to take possession of the surface, and to put the ground into a worse condition when ploughing is again attempted, than it was when grass seeds were sown.

'From these things, it will appear that a considerable share of judgment is required to manage grass-land, so that the soil may be improved, and the occupier benefited. The last object cannot be accomplished, if the first is neglected; hence, it often happens, that the grazing trade becomes a bad one when in the hands of injudicious persons. The radical error lies in overstocking; and it is even attended with great risk to stock any way fully, till the nature of each season is in some measure ascertained. From inattention to these matters, a crop of grass may be consumed, without benefiting the owner one-half so much as it might have done under different management. Nay, in some instances, grass has been lost altogether by overstocking, the cattle depastured thereon being little, if at all improved at the end of the season. To keep a full bite, is the maxim of every good grazier; but this cannot be obtained without understocking, because an adverse season may come on, and blast the fairest prospect.' p. 176—178.

The tenth chapter treats of Live Stock, and is introduced in this manner.

'Though horses, neat cattle, sheep, and swine, are of equal importance to the British farmer with corn crops, yet we have few treatises concerning these animals, compared with the immense number

number that have been written on the management of arable land, or the crops produced upon it. Whether this difference of attention proceeds from an erroneous preference of the plough, or is owing to the ignorance of agriculturists respecting the properties of live-stock, we shall not stop to determine. The fact is, however, as we have stated it; though, according to the present improved system of farming, there is such a connexion between the cultivation of the ground and the breeding, rearing, and fattening of domestic animals, that the one cannot be neglected without injury to the other.

'Notwithstanding that little has been written concerning the domestic animals of Britain, it deserves to be remarked, that the improvement of those animals has not been neglected; on the contrary, it has been studied like a science, and carried into execution with the most sedulous attention and dexterity. We wish it could be stated, that one half of the care had been applied to the selecting and breeding of wheat and other grains, as has been displayed in selecting and breeding the best proportioned and most kindly feeding cattle and sheep. A comparison cannot, however, be made with the slighest degree of success; the exertions of the stock-farmers having, in every point of view, far exceeded what has been done by the renters of arable land. With cattle and sheep considerable improvement has therefore taken place. With horses, those of the racing kind excepted, there has been little improvement; and, as to swine, an animal of great benefit to the farmer, in consuming offal which would otherwise be of no value, matters remain pretty much on their former footing.

'Having made these general remarks, we proceed to illustrate the several sections of this chapter. These, of course, are limited to the four kinds of animals already mentioned; and on each of these we shall treat at some length, considering the live stock of Britain to be a subject of vast importance to the national welfare, when the demand for horses is so extensive, and a full supply of butcher meat so necessary for public comfort and luxury. p. 202—204.

The chapter upon live stock is divided into five sections; 1. On horses; 2. On neat cattle; 3. On sheep; 4. On swine; 5. Comparative view of employing oxen and horses in performing rural work. With regard to the breeding of horses, these remarks are offered in the first section.

'The value of horses being now much more augmented than that of other animals, it appears that greater encouragement is thereby offered for breeding the best sorts than was formerly the case, and that regular breeding farms would be of benefit to the public, and advantageous to those concerned in them. Hitherto it has been usual to work breeding mares through the greatest part of the year, laying them aside only for a week or two before foaling, and, during the summer season, when giving suck to the young foal. In this

way, the strength and vigour of the mother is not only weakened, but the size and powers of the foal stand a great chance of being diminished by the exertions of the mother when kept at work. Under these impressions, we are led to consider the working of breeding mares as an unprofitable practice. Were they suffered to remain at ease, to roam upon coarse pastures, where shades were erected, in which they might find shelter during inclement weather, we are almost certain that their progeny would enter upon action with increased abilities. The expense of a breeding mare kept in this way would not be great, whilst the advantages would be innumerable. But, were the expense even greater than is incurred in the ordinary way, the superiority of the stock thus produced would much more than compensate it. A pound of horse-flesh is more than double the value of that of neat cattle and sheep; and being as easily reared and produced as the others, great encouragement is thus offered for carrying on the breeding trade as a separate establishment. It is highly inconvenient for corn farmers to want the use of any part of their working stock during the summer season; the plan, therefore, that we have recommended, seems well calculated to avoid every inconvenience of this nature, and to place the breeding trade upon a proper footing. In short, we are satisfied, that unless some such plan is adopted, breeding can never succeed in the arable districts, though it is evidently in the power of every farmer so situated to breed horses with the same facility as he breeds cattle and sheep, were the like measures resorted to.

'Horses are generally put to work when five years of age, though, it is probable, they might be worked a year sooner, were the same attention paid to their keeping as is bestowed by the improved breeders of cattle and sheep. We are not advocates for giving much grain to young horses, thinking it expensive, and not so conducive to their health as to support them on green food. In the winter and spring months, a few turnips are eminently beneficial to young horses, by keeping their blood in good order, swelling their bone, and hastening their growth. A plentiful supply of grass in summer ought always to be allowed, as their condition through the winter depends greatly upon that circumstance. It deserves attention, that flesh once gained ought never to be lost, but that every animal whatever should be kept in a progressive state of improvement, and not suffered to take a retrograde course, which afterwards must be made up by extra feeding, or a loss be sustained, in direct proportion to the degree of retrogradation that has occurred. p. 207—209.

The eleventh chapter is on Draining and Irrigation; and, of course, it is divided into two sections. With regard to the first, we have, among others, the following observations.

'Few improvements are attended with more salutary effects, than those accomplished by the removal of superfluous moisture from arable land; because, when such moisture is suffered to remain, plough-

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ing can only be imperfectly performed, while the benefit of manure is in a great measure lost. To carry off superfluous water is therefore an important object in the sight of every good farmer, meriting at all times his most assiduous attention.

'Without stopping to make any inquiry concerning the nature and inclination of the various strata which compose the interior of the earth, and serve to direct or impede the passage of water accumulated or deposited within its bowels; it will be sufficient to state the most approved modes of carrying off that water in an artificial manner, thus freeing the surface of the evils resulting from these internal stores.

'Wherever a burst of water appears in any particular spot, the sure and certain way of getting quit of such an evil is to dig hollow drains, of such a depth below the surface as is required by the nature of the substratum, and the quantity of water expected to proceed from the burst or spring. Having ascertained the extent of water to be carried off, taken the necessary levels, and cleared a mouth, or leading passage for the water, begin the drain at the extremity next to that leader, and go on with the work till the top of the spring is touched, which probably will accomplish the intended object. But if it should not be completely accomplished, run off from the main drain with such a number of branches as may be required to intercept the water, and, in this way, disappointment will hardly be experienced. Drains, to be substantially useful, should seldom be less than three feet in depth, 20 or 24 inches thereof to be close packed with stones or wood, according to circumstances. The former are the best materials, but in many places are not to be got in sufficient quantities; recourse therefore must often be made to the latter, though not so effectual or durable.

'It is of vast importance to fill up drains as fast as they are dug out; because, if left open for any length of time, the earth is not only apt to fall in, but the sides get into a broken irregular state, which cannot afterwards be completely rectified. It also deserves attention, that a proper covering of straw or sod should be put upon the top of the materials, to keep the surface earth from mixing with them; and, where wood is the material used for filling up, a double degree of attention is necessary, otherwise the proposed improvement may be effectually frustrated.

'The pit method of draining is a very effectual one, if executed with judgment. When it is sufficiently ascertained where the bed of water is deposited, which can easily be done by boring with an auger, sink a pit into the place, of such a size as will allow a man to work within its bounds. Dig this pit of such a depth as to reach the bed of the water meant to be carried off; and when this depth is attained, which is easily discerned by the rising of the water, fill up the pit with big land stones, and carry off the water by a stout drain, to some adjoining ditch or mouth, whence it may proceed to the nearest river. We have tried this method repeatedly, and were

never disappointed. Indeed, if the proper spot is pitched upon for putting down the pit, the object must be attained; because the water being there stopped or impeded by a close substratum, is immediately set at liberty, when that substratum is pierced and cut through.' p. 253—256.

In the section upon Irrigation, some information is given which may be new to many of our readers.

'We now come to another branch of irrigation, provincially called *warping*, which is one of the greatest improvements that can be exercised, adding to the value and thickness of the soil every time it is repeated. In fact, a new soil is artificially created by the operation to be treated of, and of a quality superior to that of every natural one. It is only in certain situations, however, that warping can be used; but where such situations occur, the operation ought never to be omitted. The expense varies according to circumstances; but can never, in the slightest degree, be compared with the immense benefit derived from the operation.

'Warping originated in Yorkshire, and is carried on there to a great extent, especially upon the banks of the river Ouse, between York and the mouth of the Humber. When in that district, we had an opportunity of examining and ascertaining the different branches of that valuable operation, all of which were of importance, their effect being precisely the same upon a poor soil as upon one of the greatest natural value. The river Ouse, from the circumstance of receiving into its bed most of the Yorkshire waters, is constantly stored with mud and all sorts of alluvial matter; and being stirred and kept in motion by the tide, which flows several miles above York, the alluvial matter, by the process of warping, is conveyed over the adjoining grounds, which are flat and easily flooded. Low land is, of all others, most capable of being improved in this manner. While it is enriched by warping, no person is injured by the operation; and the benefit thereby received is lasting and durable.

'June, July and August, are considered to be the best months for warping, on account of their being generally the driest months in the year, though land may be warped in any season, provided the weather is dry, and the fresh water in the river very low. When the season is wet, and the rivers full of fresh water, the operation of warping cannot be advantageously executed, as the fresh water, mixing with the tide, makes it not half so thick and muddy, and consequently incapable of depositing the same quantity of sediment upon the land as takes place when the process is performed in a dry season; neither is the water got so readily off the land during wet weather as in dry. Warping land in spring answers no better purpose than in summer, as there can be no crop that year: for the sediment must lye to soak and dry, before the ground can be cultivated with the slightest prospect of advantage. Warped land is supposed to be well calculated for producing potatoes, immense crops

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of that valuable esculent being often obtained upon soils, naturally of very inferior quality, after undergoing that process.

'It will be understood, from what is stated, that warp consists of mud and salts left by the water that has been admitted; and that the technical phrase, *warping*, comprehends all the processes necessary to admit the tide water, and to deposit its sediment upon the field meant to be so improved. Letting in fresh water would not be called warping, but simply flooding. Fresh water, though useful at proper seasons, would by no means answer the same purpose as river water stirred up by the tide; because it never could furnish a sufficient sediment for thickening the soil; neither would the sediment be of so rich a nature as what is furnished by tide water.' p. 288–291.

Enclosures and woods, or plantations of timber trees, are treated of in the 12th chapter. Section 1st being on Enclosures, is subdivided into two branches; 1. on Stone Walls, and, 2. on Thorn Hedges. After discussing these subjects, the author makes these remarks.

'Before quitting the subject, it seems necessary to state some circumstances respecting the enclosing of land hitherto too much neglected. In the first place, it often happens that landed proprietors, wishing to have their land enclosed, and not chusing to be at the trouble and expense of doing the work themselves, transfer the burden to their tenants, though such a transference is evidently an unwise and impolitical measure. It serves to take up the tenant's attention from the cultivation of his farm, and to employ his capital stock upon works very different from those in which it ought to be employed. What is worse, a farm is seldom sufficiently enclosed in this way; for though fences may be made, that is, ditches digged and thorns planted, these fences are rarely trained up in a satisfactory manner, or in such a way as to prove of real utility either to the tenant or proprietor. No doubt the proprietor may have recourse against the tenant at the conclusion of the lease, in case he was taken bound to train the fences up, and to leave them in a sufficient condition at his departure. In this case, damages may be awarded against the tenant; but such an award must be of small consolation to a proprietor disposed to have his land completely enclosed, whilst it may prove ruinous and destructive to the tenant.

'In the *second* place, proprietors who are at the first cost of fences—that is, who dig out the ditches and plant the thorns, and afterwards devolve the burden of training these fences on their tenants, do not act more wisely than the class already mentioned. As the tenant's interest in the success of such fences, during a nineteen or twenty-one years' lease, is but trifling, we are not to expect the same attention from him to the processes of cleaning, switching, and protecting them from gaps, as if he were more materially interested. This is human nature; and mankind must be taken as they are. In fact, it is the height of folly for a tenant to undertake

such a service as training up hedges; nor should any one be subjected to the leaving fences in a sufficient condition, unless they are delivered over to him in that condition in the first instance. It is plain, that this cannot happen at the beginning of a lease with a farm not formerly enclosed, unless strong walls are built; therefore a tenant ought not, under any circumstance, to have interference with fences, until that stage arrives when they can be of utility to him. The tenant's interference at an earlier period is not advantageous to either party.

'In the *third* place, as some doctrines have been lately broached respecting what is called *a common law*, which subjects tenants to support fences, whether they have come under that obligation or not, it becomes every tenant, who gets a new lease, to take care that the clause which relates to fences be so precisely worded as to leave no room for future altercation or contest. With regard to the common law alluded to, we never could ascertain whence it proceeded, nor the time it was first recognised. It could not be known in Scotland before the Restoration, as it is believed, on good authority, that an enclosed field of farm land was not at that time to be found in this northern part of the island. The act of King Charles II. regulated the enclosing of land so far as proprietors were concerned. This act, however, does not bear upon tenants in the most distant manner; therefore, that class of men, according to the strict rules of justice and equity, cannot be liable to any burden, more than those convenanted with their landlords respectively. p. 301—304.

In thirteenth chapter, the weights and measures used in the sale of farm produce, and the system prescribed by law for supporting and repairing public roads are investigated, upon which subjects many things are urged; but we shall only select one paragraph from the section upon roads, which, if it has no other merit, may be viewed as containing a novel proposition, and on that account, calculated to attract the attention of our readers.

'The subject cannot, however, be dismissed without offering one or two remarks upon the statute-labour system. The system must be radically defective, because it is founded upon the principle that the roads of every parish can be maintained in good condition at the like expense, notwithstanding it is manifest that many parishes have more roads than others, consequently that more money must be required for repairing roads in parishes so circumstanced, than in others differently situated. The procuring of materials for making repairs is much more difficult and expensive in some parishes than in others, consequently good roads in all of them cannot be procured at the like expense. On these accounts, it has always appeared to us that it would be wise and expedient, were the heritors and tenants of every parish permitted to assess themselves in such a sum as might be required for keeping the roads within their bounds in good order and condition, it being always understood that the

the aſſeſſment was not to be below the rate fixed by the Legiſlature. We are quite aware that every pariſh may expend what ſum it pleaſes in repairing the roads, over and above what it is bound by law, and that the Juſtices will not call thoſe concerned to account for ſuch over expenditure. This is true; but, without the ſanction of an act of Parliament, how could an extraordinary aſſeſſment, made by the majority of a pariſh, be put in execution againſt the minority, in the event of ſuch an aſſeſſment being reſiſted? We are perfectly ſenſible that the majority of many pariſhes would willingly aſſeſs themſelves in a greater ſum to the repair of the by-roads, than they are legally obliged to do, could the aſſeſſment be made effectual againſt all thoſe concerned; but it can never be expected that one part of a pariſh will contribute more than others, when the object to be gained is of general advantage. In our humble opinion, every ſtatute-labour act ſhould contain a clauſe permitting the heritors of the ſeveral pariſhes to aſſeſs thoſe liable for repairing the by-roads, in ſuch ſums as may be neceſſary for putting and keeping them in a complete ſtate of repair; it being always expreſsly declared, that the rate of aſſeſſment was in no caſe to be below the rate fixed upon in the Legiſlative enactment. In England, the repair of any road may be procured by indicting the pariſh or pariſhes in which it is ſituated; but in Scotland no law exiſts by which the repair of any road can be enforced; and provided the heritors of a pariſh can ſhow that their ſtatute-labour has been expended, no recourſe or remedy lies, notwithſtanding the roads of ſuch a pariſh may be in the moſt dangerous and impaſſable ſtate. That good roads every where is an object of great public utility, is a propoſition which none will deny; therefore, it follows, that general laws reſpecting the maintenance and ſupport of public roads can never be effective or uſeful. The law, in every caſe, ſhould be framed to meet the circumſtances of the diſtrict for which it is paſſed, otherwiſe the public will never enjoy the benefit of good roads. p. 331—333.

The *conclusion* contains a recapitulation of the obstacles in the way of improvements, and some hints how these obstacles may be removed; and, in the Appendix, some papers are given in illustration of the rural doctrines, inculcated in the several chapters of the work, together with copy of a lease, considered by the author as well adapted to the husbandry of Scotland, particularly in those districts where agriculture is sufficiently understood and accurately practised. N.

BRANCH III.

AGRICULTURAL INTELLIGENCE.

At the date of our laſt publication, rural matters were far from being in a promiſing ſtate. The fields were drenched with moiſture, and hardly capable of being ploughed with the ſlighteſt proſpect of advantage; fallows were generally in a wild ſtate; even thoſe intended for turnips, were, in many places, quite unprepared for receiving the ſeed of that valuable eſculent. About the middle of June dry weather returned; and, before the end of that month, almoſt the whole grounds intended for turnips were ſeeded, though, in many inſtances, the preparation could by no means be conſidered as perfectly executed. Under theſe circumſtances, it is ſatisfactory to learn, that the appearance of the young plants is far from being bad; though, as moſt of them are later than uſual, the chance of their being well rooted is not ſo great as in ordinary years, unleſs the autumn quarter ſhall prove particularly favourable. The plain fallows, according to moſt of our accounts, are now brought into ſomething like a decent ſtate, which is a matter of great importance every where; for, if the fallows are neglected, all the crops of the ſucceeding courſe, perhaps the firſt one of wheat excepted, will be conſiderably injured, and, by conſequence, a return to that radical proceſs becomes ſooner neceſſary.

The wheat crop, this year, is generally conſidered as nearly equal to an average; but it is a queſtionable matter whether an average is now equal to the conſumption of that article, as the population appears to have conſiderably increaſed ſince 1801, when an actual numeration was made. If poſſible, a copy of the Cenſus of this year ſhall be laid before our readers in next Number; though, from the liſts already publiſhed, it would not excite our ſurpriſe, were the total number of inhabitants to be one million higher than in 1801.

Markets for grain have rather advanced in the ſummer months, though, by that advance, the farmer will not be compenſated for the riſks and loſſes which, leſs or more, befall him when he holds on to this period of the ſeaſon. The ſtock in hand is not ſuppoſed to be great; though, as the new crop will ſoon be at market, there is no great cauſe to dread a ſcarcity, unleſs bad weather occurs during the harveſt ſeaſon. The butcher market has remained nearly ſtationary; and, upon the whole, has been well ſupplied. The feeding trade, however, has not been a profitable one, as the benefits thereof were in the firſt inſtance ſecured by the breeder; and ultimately the butcher has drawn his full ſhare.

Wool has, over the whole iſland, been almoſt without ſale this ſummer; or, if ſales were made, they were in every caſe at prices greatly reduced. The fine wools have fallen moſt, which furniſhes a proof of the clothing trade being in a retrograde ſtate. Indeed, the riſe of laſt year was too great to be ſuſtained; and thoſe who then took land upon the

the faith of that rife, have now cauſe to mourn and lament that it ever occurred. From what paſſed at Holkham, there is cauſe to apprehend that the breed of Merino ſheep, in England, will not be extended. Indeed, what was urged by Mr Coke on that ſubject, ſeems to have ſet that breed with their backs to the wall in the fight of many people. After all, in a country ſuch as Britain, it is a matter of vaſt importance, that the ſtock of ſheep kept, ſhould be ſuch as is beſt calculated to fill the belly, rather than to ornament the back. The carcaſe is a neceſſary of life; whereas the fleece of fine-wooled ſheep can only be regarded as a luxury, which ought not to be ſought after, till a full ſupply of the neceſſary article is obtained. If it can be ſhown that the Merino ſheep and other fine-wooled breeds will yield as much of the neceſſary article as the Leiceſter and other long-wooled ſheep; then, by all means let theſe fine breeds be patronized and encouraged, becauſe the ſuperior value of their wool is certainly a matter worthy of attention; but, till this is ſhown, it may be queſtioned, whether the Merino and other fine-wooled ſheep are entitled to receive ſo much countenance and ſupport, as have lately been beſtowed upon them. The ſubject is of importance;—therefore we have hazarded theſe few obſervations, ſo as the attention of our readers may be called to it.

Our worthy friend, and ſteady ſupporter, the Right Honourable Sir John Sinclair, Baronet, being appointed General Caſhier of Exciſe in Scotland, has of courſe given up his ſeat in Parliament, and will, we underſtand, be ſucceeded, as member for Caithneſs, by his eldeſt ſon George Sinclair, Eſquire, a young gentleman of the moſt promiſing expectations. Sir John is faſt proceeding with the general Report of Scotland, a conſiderable part of which is already printed; and, from the ſamples now in circulation, there is cauſe to preſume, that it will far exceed any thing of the kind hitherto publiſhed. We have not heard of the progreſs lately made in Sir John's private Treatiſe upon the huſbandry of Scotland; but preſume, that his attention has of late been ſo much engaged by other ſubjects, namely the paper credit of the country, and the ſtate of the public roads, &c. that he has not had the leiſure neceſſary, to go on with his treatiſe in that active manner hitherto given to every undertaking in which he has been engaged.

Our Mid-Lothian Reporter will ſee ſome notice taken of his queries about the Property-tax in the letter of intelligence ſent us from Falkirk, by a gentleman perfectly well acquainted with all the bearings and conſequences of the Property-tax act. What is ſtated by that gentleman, reſpecting the operation of the act upon ſmall tenants, agrees entirely with what has been repeatedly urged in this publication, namely, that if tenants will not ſtate, in their returns, that they have no other ſources of income, than from land,—or, if they have other ſources, and do not condeſcend upon their nature and extent, they will be aſſeſſed according to the maximum rate of tax. This is perfectly fair;—therefore, tenants poſſeſſing ſmall farms, without any other income, who are charged according to the maximum rate, have only themſelves to blame when they are overcharged, if it is not intimated to the aſſeſſor that they have no other

other ſources of income than what is derived from the farms in their poſſeſſion reſpectively.

SCOTLAND.

Lanarkshire Quarterly Report.

One of the mildeſt ſprings in our recollection, was followed by rains in May, and the beginning of June, far more copious than any ever remembered by the oldeſt inhabitants. Since about the middle of June, however, theſe rains have been leſs frequent; yet thoſe which took place, having fallen before the damps of winter had been extracted from the ſoil (a thing of great importance in ſo rainy a diſtrict as the lower parts of Clydesdale, where a cold clay ſoil ſo much abounds) have greatly injured almoſt every ſpecies of crop.

The *wheats* are in many places thin; and in clay lands, where the ſoil has been reduced to the ſtate of mortar almoſt ever ſince the ſeed was committed to the grouud, the plants are ſtunted and puny; and where the ground has but ſmall declivity, or the ſurface is not completely relieved of ſtagnant moiſture, the crop is entirely loſt. In ſandy lands, over a permeable ſubſoil, or where the more tenacious clay has been enriched, and its powers opened by cultivation and manure, the crop is abundant, and the plants healthy and luxuriant.

Oats, and early ſown barley, look very well, except in damp places, where they are completely drowned. On newly broken up moſs, oats promiſe an abundant return. Beans and peas never appeared more luxuriant. But the growth of weeds among every ſpecies of crop is alſo luxuriant beyond example.

The heavy and continued rains during the ordinary ſeaſon of planting, prevented a conſiderable portion of the potato crop from being put into the ground; and the preparation of the ground planted, was ſo imperfect, that except in very dry land, there is ſcarcely the appearance of a crop. In clay land many of the ſeeds have rotted, and ſome farmers have turned the land on which they were planted into fallow. In ſhort, the potato crop does not promiſe to exceed one half of a medium return; a privation much to be lamented, but which no human foreſight could remedy.

Raygrass and *clover*, ſo often injured by drought in ſpring and beginning of ſummer, are far above a medium crop; yet not generally ſo weighty as might have been expected, in a ſeaſon ſo uncommonly wet and warm. In clay ſoils the hay crops have been much injured by the heavy rains. The abundance of natural graſſes among that ſpecies of hay, has rendered it difficult to collect the ſeeds. But as the weather has been favourable for cutting and drying it, the hay has been got into the tramp-ricks in the beſt ſtate of preſervation. That ſpecies of crop is often much injured by being allowed to remain too long in the ricks.

Paſture land never yielded earlier, or more abundant food. Of courſe every ſpecies of live ſtock, fed upon it, ſeldom if ever fared better; and

and as milch cows went to pasture in good plight, the produce of the dairy was never so early and abundant.

The uncommon number, and severity, of some of the thunder storms, particularly that on the 14th May, has in a great measure blasted the finest prospect of an abundant crop of fruit, that the orchards on the Clyde ever exhibited. Except gooseberries, the fruit will not much exceed one half of a medium crop.

The uncommon luxuriance of the pasture has tended to raise considerably the prices of cows and sheep. Grain experienced a rise of five per cent., or so, in price, about the end of June; but has remained steady, or rather fallen, since.

The excessive rains have, among other evils in their train, in a great measure frustrated the intention of that important and salutary improvement, *fallow*, on clay soils. The ground has been soured into mortar; and the weeds, which have grown luxuriantly, could not be eradicated, or kept from seeding.—22*d July.*

Perthshire Quarterly Report.

At the date of last Report, the weather had by no means a flattering aspect; and the fears then entertained, proved to be too well founded. The heavy rains, which, even at that period, had seriously injured some of the crops, continued till about the 17th of June. They were then, however, succeeded by a tract of very fine weather, with sometimes a few drops of rain, but generally very dry, till the 14th instant. Since that time a good deal of rain has fallen at intervals, sometimes accompanied with high winds. The whole of the 23d, and the evenings of the 24th and 25th, were distinguished by violent westerly winds without rain. Fortunately the wheat was generally out of blossom some time before, otherwise it must have been severely injured. There is some reason to fear that what has been lodged by the late rains will suffer; but, in other respects, the crop promises as well as at the date of last Report. It is perhaps, upon the whole, rather thin than otherwise. Barley, as might be expected, from the circumstances in which it was generally sown, will be deficient. Oats, though they promised well in *braird*, received a check by the continuance of wet weather, and will be short in the straw. In corn, however, they promise well. The hay crop is in many places complained of; not as being absolutely deficient, but as falling short of expectation. The rains, which were at first beneficial to it, proved ultimately injurious.

The spring was as unfavourable for the potato seed as any other; and though that crop looks much better now than any body could have predicted two months ago, it has not that appearance which it ought to have at this season. There is reason to believe turnips will in general be productive. Leguminous crops are every where luxuriant, and only require dry weather to insure a good return. Fallows are in a much more forward state than could have been expected, considering the very unfavourable circumstances with which that process had to struggle. At the same time, the benefits to be derived

rived from it, will by no means be such as they would have been, had the work commenced earlier, and been executed with fewer interruptions.

There is a very general complaint with regard to orchard crops. In many places, where the appearance was most promising in the flowering season, there is literally no fruit at all. The enemy was a small species of the caterpillar. It has occurred on this subject, that the uncommonly mild weather in March had organized and animated these insects at an earlier period than usual, and that the time when they are most vigorous, and which is generally after the fruit is set, corresponded with the time of blossom, which consequently fell a sacrifice to their depredations. The apples seem to have suffered most; though the small fruit has by no means escaped uninjured. But this is not all. If the country people's ideas of *cause* and *effect* be correct (ingenious they certainly are) the disease of the fruit has been communicated to man, and is now raging in the form of an alarming epidemical fever in a district of this county.

The price of grain, since last Report, has on the whole been on the advance. The greatest rise has taken place on barley, which is quoted four or five shillings dearer. Taking the market in general, however, the advance is trifling;—an incontestable proof at this season, if any further proof was wanting, of an excessive importation.

To guess at what is likely to be the consequence of the present state of things to the agricultural interest, might perhaps be considered as one of those predictions which tend to their own fulfilment. It is not too much to say, however, that important changes will in all probability take place, before another quarter elapse.—*26th July.*

Letter from Inverness-shire, July 27.

'The weather for the most part of summer has been dry, especially since the 16th of June to the 12th of July, during which period we had nothing but burning drought; and, of course, the corns on light soils have suffered much, and some of them are past recovery. The crop on the whole, appears to be light, and straw very short, except on some few fields after potatoes and summer fallow which had been well dunged and in high condition. The progress of the turnip crop is slow, owing to dry weather in the sowing season; and the thinning process is rather farther behind than usual, the braird having been slow: however, if the weather continues favourable, they bid fair for a rapid growth afterwards, as the ground was in general well prepared. Hay appears to be a fair crop, as it was well advanced before the dry weather commenced; and the most part part of it is in the rick. Cattle markets are rather dull; though high prices are demanded by the sellers, notwithstanding the demand is but trifling. Oat meal is about 27s. per boll of 9 stone Dutch; butcher meat from 6d. to 8d. per lib. of 17½ ounces; and mutton much about the same price. The distillers began very brisk in the spring; but a great many of them are talking of giving

up

up again, on account of the high duties laid on them, which they say is more than the trade is capable of paying.'

Letter from a Farmer in Annandale.

'The sown-grass hay is all cut, and got into *pikes*, in good condition, except what has been in hand during the last eight days, which is a little discoloured. Oats and barley, which compose the greatest part of our grain crops, look tolerably well, though in some situations they suffered severely from the wetness in May. There seems to be more wheat this season than usual, likely owing to the high prices which that article has brought of late. Turnips are not extensively cultivated here, most of the farmers preferring potatoes; few farms, of any considerable size, having less than ten or twenty acres annually, upon the produce of which great numbers of swine are fattened. The demand for bacon and hams for the London market is brisker than at the date of my last, and prices have advanced 1s. 6d. per stone. This has been a good season for pasture grass; but few cattle are grazed in this neighbourhood, except milch cows, their calves, and a few stirks. The cattle markets in the South of England have been pretty steady for Galloway beasts through the summer: but the jobbing trade, from various circumstances, has of late been much restricted. Store sheep have sold readily, and brought good prices. Fish have not been plentiful this season, and salmon is selling at 8d. per lib.; but most of that fish caught in the Solway Frith is contracted for and sent into Westmoreland, Yorkshire and Lancashire. It is thought that the tacksmen of the fisheries will suffer severely this season.'

Letter from Langholm, 29th July.

'The moist and rainy weather which prevailed during the greatest part of May and the first fortnight of June, produced a most abundant vegetation in the pastures; but the corn crops were in many places hurt by an excess of moisture, particularly on light, cold, clay soils; and the succeeding dry weather which commenced about the middle of June, gave them a check from which they are not likely to recover during the season. Potatoes suffered from the same cause, and are generally stunted in their growth. The hay crop from sown grass, on rich dry soils, is generally good, but not so very abundant as the early part of the season seemed to promise. Several fields of barley have been much injured by smut. The turnip fields have vegetated more freely and equally, than the circumstances of the weather and season might have led us to expect, and appear at present in a thriving state. The crops in general present a favourable appearance on rich mellow soils, but are somewhat later than usual. Severe thunder storms, accompanied with torrents of rain, have prevailed during last quarter, particularly on the 8th of June, which did considerable damage in many places within the sphere of its range.

Our markets for meal and grain have experienced very little variation since last report. Butcher meat has been plentiful during

the season, but the prices have been very little reduced to the consumer. Our wool fair, held here on the 15th instant, was pretty well attended by dealers from Yorkshire, and farmers in this and the neighbouring districts; but scarcely any bargains were concluded, as the prices offered by the former were far below those of last year, and the expectations of the grower. Some parcels have been sold since; but it is impossible, as yet, to fix any thing like an average rate, as the greatest part of last year's clip remains unsold. What has been sold is understood to be about 10s. or 12s. per stone below last year's price, forming a reduction of from 30 to 40 per cent. on last year's rate. We had a remarkably fine show of lambs at our annual fair here on the 26th instant. There was a tolerably good demand; but the prices were lower than those of last year about 1s. or 1s. 6d. a head. The average rate of good Cheviot lambs might be fixed at nearly 10s. a piece. A few lots remained unsold. Black cattle had a rapid sale, and brought good prices, in the early part of the season; but the demand at present is rather decreased, and prices lower. In short, the price of every article of farm produce seems to be now on the decline, which renders the situation of the occupier of the soil none of the most enviable, when we consider that he has an enormous advance of rent to discharge, burthensome taxes to pay, and an increased expenditure to support.'

Kincardineshire Quarterly Report.

Immediately after the date of last report, there were three weeks of almost constant rain, which greatly impeded the working of turnip and summer fallows, and prevented the sowing of turnips till fully a week after the usual period. It was not sooner than the third week of June that that operation could be decently embarked in; and, even then, the ground was by no means so well cleaned as was formerly anticipated. Through the latter end of June, the weather became singularly warm and serene, and soon made a visible improvement in the appearance of corn crops, particularly barleys, which formerly wore a very languid aspect. From the long tract of hard, dry weather, previous to 12th July, vegetation was again beginning to be much suppressed; but, eight or ten days of fine refreshing rains succeeding, proved a radical cure to the growing crops,—arriving at the time when the corn fields were just beginning to show the ear. Wheat may still retain the character as formerly stated: and, should the ensuing month prove mild and dry, may be expected to yield well. Oats have mended surprisingly of late; they now have a very promising appearance; and, if the weather holds moderate, will, in few cases, stand much in danger of lodging. Barley does not seem to reach an average crop, although some partial good fields are to be seen. Both beans and peas are somewhat deficient in appearance. Turnips, under good management, exhibit a very thriving aspect, having, under the influence of the July rains, received an even braird; being the

means of causing the dormant seeds to vegetate, which otherwise would have remained in a lifeless or inactive state. Potatoes are an ordinary crop, but rather late: Hay, not so weighty as was expected in the early part of the season; nevertheless, it is equal to an average crop, and almost all in the tramp rick in the best possible order. Pastures have all along afforded a great deal of eating; more so, than for several years bygone. Indeed, the present prospect of the corn crops in this district indicate at least a fortnight earlier harvest than last year, did not so much yet depend upon after circumstances.

Markets for stock have been pretty stationary through the season; prices tolerably good; and sheep from the hill never were more in request. Labourers have been more plenty this year than for several former ones, owing principally to the small reduction that occurred in the rate of wages at the hiring Whitsunday markets.—*July* 29.

West Stirlingshire Quarterly Report.

The cold rainy weather which was so embarrassing to several operations during May, continued without intermission till the middle of June. The seed process of barley, which had been so long discontinued; was then resumed, and a very great part of that crop was sown in this district from the 17th till the 20th of that month. Oats were much injured by the excessive rains; and as, in the wet heavy soil which prevails here, excess of moisture is more permanently destructive than excess of drought, the injury has not been remedied by the recent favourable weather, and will continue probably visible, at harvest, in the diminished quantity of straw, and in the inferior quality of grain. Wheat is greatly improved, but will rarely come up to an average crop. Beans are very promising. Potatoes, from the unfavourable state in which they were planted, have come up very irregularly, but are in some cases affected with the curl, a disease formerly here unknown. Hay has turned out a good crop, and has been harvested in excellent order: but there is very little demand from the mercantile classes: Perhaps, from the deficiency of straw, farmers will be obliged to retain it for their own use.

Pasturage has been, and still continues, abundant. Some grounds are not fully stocked, cattle being so scarce as hardly to be bought at any price. The number supplied by the Highlands, this season, has not been equal to that of former years. The markets have been always rising; and now lean cattle fetch better prices from the grazier, than fat ones can obtain from the butcher.

The produce of the flock meets with an unfavourable market. Wool is greatly fallen in value, and has sold generally at 7s. per stone. Lambs, though in the best order, from the excellence and abundance of pasturage, are about 1s. below the rate of former years: Some parcels have brought 10s. 6d. a head; the average is about 1s. lower. This depreciation falls not so much on the carcase, as on the skins, for which there is scarcely any demand.

For the last month, grain markets have been gradually rising. Oatmeal now fetches readily 22s. 6d. per boll; and, towards Glasgow, 24s. is obtained for the best quality. The cause of this rise seems to be connected with the scarcity of potatoes at this season. That wholesome and nutritive root is generally used by all ranks during nine months of the year. Some poor families regularly make three meals of potatoes daily: very many use them for two meals. From inquiring at various shopkeepers in country villages, it is found that from midsummer, when the potatoes of the former year are consumed, till September, when the market becomes plentifully supplied with the new crop, the consumpt of wheat bread is nearly double, and that of oatmeal is nearly triple of what is used during the rest of the year. This increased consumption must heighten the demand: but although the prices have risen somewhat, there is no reason to apprehend any deficiency in supply. There is abundance of grain in the market, and a considerable quantity unthrashed in the rick.——*July* 29.

Upper Annandale Quarterly Report.

THE long continued rains of April and May have been followed by fine weather; and the damage has been thereby, in part, made up. *Sown grasses* have, in general, yielded a good crop of hay; and the second clovers begin to rise well. But, in many parts, where the soil was poor, or the grasses much eaten during winter, the hay is very light. *Oats*, in a few cases, are fine: in many others, indeed in general, they are thin, and weak; and they are full of the worst of weeds, the knot grass. It is almost certain, that this crop will be very deficient. *Wheat* never looked better: the crop is even and thick, and the ears apparently full. If mildew keep off, this grain is probably in a considerable degree above the average, both in quantity and quality, throughout this district. *Potatoes* were, in many wet spots, entirely rotted out; and in most fields there are numerous blanks. The crop of this root appears much inferior to that of last year; but a larger extent is under culture. *Turnips* were were late in getting in, and are far from promising much. A good deal of land intended for them, was prepared so ill, that a plain fallow is preferable. *Flax* is really a good crop, almost every where, in this district. *Markets* continue good for cattle and sheep. As to wool, no sales have yet been made: The buyers are talking of prices very much reduced: There is a degree of stagnation; and they are afraid to purchase, and willing to understand one another. *Rents* and *labour* have not been reduced. The population increases every where, otherwise labour would have risen more. Improvements employ this increased population, and at same time furnish the means of their subsistence.—29*th July.*

Extract of a Letter from Ayrshire, 29th July.

'THE soft weather which commenced in April, continued till towards the middle of June; since that time it has been generally dry and mild, with some occasional fine showers. The heat and moisture in the

the beginning of summer, with the fine weather which succeeded, have produced a high degree of vegetation, especially in all dry soils; and even fields of a different description, that seemed to be much affected with the excessive moisture, have greatly recovered since the dry weather commenced; so that, in so far as they have yet advanced, the several crops promise to be abundant. Wheat, (of which a considerable quantity is now sown), oats, and peas and beans, are all looking well; and, so far as is known, no mildew, nor smut, nor canker, have yet appeared to injure them. If there is any deficiency, it will probably be in the article of potatoes, in all wettish kind of soils. On dry ground, where they were got timeously planted, they never looked better than they do this year. No doubt, this is the critical season; and much depends upon the state of the weather during the ensuing fortnight or ten days; but if it shall continue favourable during that time, there is every appearance at present that the labours of the husbandman will be amply rewarded. The price of grain has not decreased since last Report; it has rather increased a little; and the demand has been brisker than for some time before. The principal change has been in the state of the cattle market. Cows for the dairy are uncommonly high; and the demand and price of cattle for the south country were scarce ever greater at any former period.

This, as I have often mentioned to you, is an improving county; and the improvements are every where going on rapidly. As the old race of farmers become extinct, the rising generation study to emulate the modes of those places where culture is more advanced; and are daily banishing, in succession, some one or other of those barbarous customs that were used by their ancestors. Nothing shows more clearly the state of improvement of this county, than the extension of the dairy system; which cannot subsist but where cultivation has considerably advanced. From Cuningham, where it began, the dairy has extended almost over the whole arable part of Aryshire, and even reached to some of the valleys of the higher ground. It is perhaps this, with some other similarity of circumstances, which has caused some people give this county the name of the GLOUCESTER of Scotland. It may be owing to this progressive state of improvement, that the same depression has not taken place in the value of land in this county, which is said to have taken place, or threatened to take place, elsewhere. In so far as I know, the demand for farms continues to prevail, and probably will continue for some time to come, even at an increase of rent, unless some unfavourable external circumstances shall occur. Then only will it become stationary when cultivation has attained its *acmé*, and the extent of the general population shall ascertain or limit the extent of the farm produce: And there are few parts of the west and south of Scotland that have yet arrived at that state of perfection.'

Tweeddale Quarterly Report.

The weather, during the summer quarter, has, upon the whole, proved favourable to corn crops of every kind, though the continued wetness which prevailed during the last week of May, and the two first weeks of June, was rather injurious to the young barleys. The same cause also retarded the sowing of turnips longer than could have been wished; but as drought suddenly set in about the middle of last month, the seed process was expeditiously carried on, though the ground in many instances worked rather unkindly, particularly such as had a mixture of clay. The plants, however, appear to be healthy and promising; as are also grain crops of every description. Within these few days past vast swarms of small insects have made their appearance upon the pea crop, which, before that event, was in a flourishing and thriving condition. They seem to be the same species of insects which completely destroyed that crop of grain about five years ago, and are known here by the name of *green lice*. They are found in clusters at the bottom of the small tendril which unites the blossom to the stalk, where they suck the nourishment from the blossom, which soon falls off, and leaves the top of the stalk, which should have produced the succeeding blossoms, in a shrivelled and decayed condition. Such is the present state of the evil; but how far it may proceed, it is impossible to say. The only chance in favour of the crop is, that as the weather is at present unsettled and blustering, these vermin may possibly be shaken from their seats, and further damage prevented, as the least motion makes them fall to the ground.

The hay crop, though not so weighty as was at one time expected, is nearly all got into the rick in good condition; and as the weather is showery, a good aftermath may be hoped for. As pasture grasses were early, and continued abundant, an unexpected demand took place both for sheep and cattle, particularly the latter; but at present a retrograde course is rather dreaded. At Linton market there was a good demand for black-faced hogs, which brought fair prices; and at other markets black-faced lambs, for holding, were disposed of at rates not much below those of last year The same remark, however, cannot be made with respect to the fine-wooled breeds. The wool, which seems to have been the principal cause of their introduction into this county, and perhaps into Scotland, has this year turned out a mere drug; and as few of the merchants will condescend to offer a positive price, it is probable a considerable part will remain in the growers' hands.

Grain markets started 10 per cent. about the end of June; but have scarcely since maintained that small rise. The demand, however, is rather brisker, though prices are stationary. Oatmeal sells at present at 18s. per boll of 8 Dutch stones. Peas and barley meal at 16s 6d. per ditto. Blainslie oats at 19s. per Linlithgow boll. Potato oats at 21s. per ditto. Barley at 26s. to 28s. per ditto. Peas at 24s. per ditto.——*July* 29.

Ross-

Ross-shire Quarterly Report.

The corn crops in general are, in this county, under favourable circumstances; and, should the present fine weather continue for another month, bid fair to give an abundant harvest. It is not meant that the prospect exceeds that of an average season; though, generally speaking, it seems fully to come up to that standard, the crop of oats excepted.

A tract of dry weather, which lasted till the 12th of July, affected corn on thin dry soils; and pasturage on such lands, which till then had been abundant, received a considerable check: But copious showers falling at that period, critically important, and continuing at intervals for nearly a fortnight, proved highly beneficial to the corns shooting into ear. Notwithstanding the atmosphere kept clear the most of that time, yet some fields of wheat have received a tinge of rust in a slight degree. Very little of the hay had then been got into the tramp-rick before this, consequently was partially damaged: but it is now generally secured either in the rick or stack. The crop of it has not proved so heavy, in many cases, as was expected; though there is no ground for complaint.

Potatoes look very indifferently on strong soils; but, on dry lands, that crop appears equal to an average one.

Turnip fields, in many cases, made a very irregular braird; and, as commonly happens in such a case, an indifferent crop only may be expected. The cause of this, in general, proceeds from a want of due care in completely rotting the dung intended for that crop. Farm-yard dung cannot be deemed in a proper state for turnips, unless it will work easily with shovels when applying to the land. No doubt, other essentials are requisite; such as the land's being previously well pulverized and cleaned; the preserving of moisture, good seed, &c. But the fault most commonly is in the dung. The land having scarcely ever been too raw for working, the fallows are well advanced, most of them being nearly ready for receiving the dung.

Corn markets have been extremely languid. Good wheat at 35s. per Linlithgow boll. Barley from 26s. to 28s. in wholesale, and from 30s. to 35s. in retail, with credit. Oatmeal from 26s. to 28s. per 9 Dutch stone.—Cattle are in demand at good prices; but so scarce, that a lot of good three-year old stots cannot be had.—There is not a prospect of a general harvest sooner than September. —*Aug.* 1.

Forfarshire Quarterly Report.

The weather in the beginning of June was uncommonly wet, and adverse to the cleaning of turnip land and fallows, and to the growth of the corn crops on wet thin soils; but, since that period, more mild and dry weather has prevailed, and something has been done towards cleaning the fallows. The turnip crop, in many instances, has failed, or at least is very far behind, on account of the imperfect preparation necessarily bestowed.

The crops on dry deep soils are luxuriant; but those on thin clays and moorish soils merit a very different character. Wheat has improved considerably, but will scarcely equal an average crop: No disease has as yet appeared on it.

Cattle nearly keep up their price, but the demand is rather slackened. Grain markets are steady, except for barley, which has risen a little in price.—The quantity in the hands of the farmer is but trifling.

Land rent cannot be said to have fallen much; but, a depreciation will evidently soon take place, especially on inferior soils. A good many farms, let about two years ago, are falling into the hands of proprietors; and few inquiries are now made after them. ——*Aug.* 1.

Dumfries-shire Quarterly Report.

Since last report, the weather has been generally wet, except the last half of the month of June, which was very dry and warm. In that time, and in the first week of July, a great deal of sown-grass hay was made, the crop of which is generally good. The meadow hay is now making, and promises to yield an abundant crop also. —Turnip land ploughed in the winter was in good preparation for the seed from the 20th to the 30th of June; and those then sown are now in a promising state, as are also the Swedish turnip sown within the month of May in land early prepared; but turnips sown upon land not ploughed till late in the spring, are, indeed, very unpromising. Potatoes, planted on dry soils, and on land well wrought, appear a fair crop; but those on heavy soils, and such as were late of planting, never appeared worse; in flat, cold, or wet grounds, very much of the seed perished; so that, even in this county, which has so long excelled in the growing of potatoes, this crop, as well as that of turnips, will be uncommonly deficient, though on particular farms exceptions may be discovered. It is in these trying seasons that the attention and management of the farmer, as well as the quality of the soil, are most easily distinguished. Corn crops will generally be deficient, though, perhaps, wheat may be an exception, as it has a full and regular appearance; yet there is cause to fear, that, on exposed situations, considerable injury has been done to this crop, by the storms of rain and wind, particularly that on Sunday the 13th of July. It may be remembered, that about the same day of the year 1790, many fields of wheat were destroyed by a heavy wind storm. It was then doubted whether the destructive effect was occasioned by loosening the root, or by tearing the flower from the ear; though it was of little consequence to ascertain which, the injury being beyond remedy or prevention. Oats upon dry clean soils are a good crop; but in foul, cold, or wet land, they are generally poor and unequal. Barley is, on the best land, but an indifferent crop, and generally much inferior to an average. In these the difference of management, as well as of land, is conspicuous. The superiority of the corns of the good farmer over those

those of the bad manager, has not for many years been so distinguishable as in the present one. Were the high characters who have opposed the plain or naked fallows now to take a look of the fields of oats in this county, it is believed they would acknowledge the good effects of sacrificing every sixth or eighth crop of corn, for the purpose of destroying weeds, the great robbers of the soil; and would not doubt, if that were accomplished, 30 or 40 per cent. in value would be added to every other crop.

Sheep and cattle have sold at good prices, paying the breeder extremely well; and the grazier would also have had a fair return, if the price of lean cattle had not been extravagantly high last autumn. Wool, however, the most material article of the produce of the storemaster, has had a great fall in price. The staplers of Yorkshire came down as usual, and attended the markets; but it is believed they have made no purchase at a price. About 40 per cent. less than that of last year, is what they have generally pointed at; but few, if any, bargains were made, without reference to times in case they should be lower. This is a loss of great consequence, not only to the wool grower and his landlord, but to the growers of all produce. Few instances are remembered of a fall of wool, without its being accompanied with a fall of all other articles, except in seasons of paticular scarcity. The present fall of wool, however, may be accounted for; the prices of last year were the highest ever known, and without any reasonable foundation; this of itself would naturally, and perhaps justly, authorise the staplers to offer less than the present circumstances would afford. The rumour also of a war with America has had a considerable effect in depressing the expectation and spirit of the manufacturer.

The price of wheat continues from 8s. to 9s. the bushel; Barley, the small remains of it, at 4s.; Oats have risen about 6d. and Oatmeal sells from 2s. 3d. to 2s. 6d. the stone.——*Aug.* 1.

Dumbarton-shire Quarterly Report.

The rains which began in May continued, almost without intermission, till the middle of June, doing considerable injury to the potatoes and bear, both of which, it is feared, will fall considerably short of an average at harvest. Since the middle of June, the weather has been most favourable, and the wheat and oats promise well. Many spots of the wheat fields are observed to be fired or blasted this season; but the oats are expected to be a plentiful crop. Pasture grass has all along been excellent. The hay crop is abundant, and has been well saved. Prices are expected to be moderate, and considerably lower than last year.

Prices of grain have been improving slowly during the past quarter. In meat and cattle markets no material alteration. Since the stagnation of trade, labourers have been in plenty, and wages lower. If the good weather continues, harvest will most probably commence in the end of the present month. ——*Aug.* 2.

Letter from Glasgow, August 2.

'During the space of three weeks after our last letter of intelli-

gence, the weather continued very unfavourable for committing to the ground what of the seed remained unsown. A considerable quantity of potatoes was not planted, as the ground, owing to the heavy rains that had fallen, was in many places altogether unfit for their reception. Such as were planted on stiff, wet lands, have a very unpromising aspect; and will, we are afraid, even with the assistance of the best weather, turn out a very poor crop. Wheat remained for a long time in the poorest condition; but, under the auspices of the weather, which has, since the latter end of June, been, with scarcely any intermission, exceedingly warm and genial, it has greatly improved; and is now making a rapid progress towards maturity. Still, however, it is in general but a light, and, we are apprehensive, will fall short of an average crop. Oats are in a state similar to that of wheat. Some very fine fields are to be seen, but the crop is light in general. Barley, of which grain there was a small quantity sown in our neighbourhood this season, exhibits a very indifferent appearance. Beans and peas appear an average crop. Hay, in this quarter, has been got secured in the best possible order, and is said to be a fair crop;—price in the rick about 70s. per 100 stones, tron weight.

'Since last report, the importation of foreign grain to this market has not been great;—only about 10,000 bolls oats from Ireland, and a few cargoes of foreign wheat from Leith, and of British oats from the north of Scotland. We have had, however, a considerable quantity of wheat from Ayrshire, and a good supply of oats and oaten meal from Galloway;—not less than 8000 bolls wheat from the former, and 5000 bolls oats, and about the same quantity of oaten meal, from the latter. But, notwithstanding these supplies, our old stock is wearing fast out, and prices are consequently getting higher. Sweet oats, since last report, have risen about 2s., and sweet Scotch wheat about 4s. per boll; and unless a more extensive importation takes place before harvest, we have reason to believe the prices of all kinds of grain will experience a considerable advance; the supply being at present inadequate to the demand.

State of Glasgow Markets, August 2.

Wheat	Dantzic.	44s. — 48s.	p. Linlithgowshire boll.
———	Foreign Red,	34s. — 38s.	
———	Scotch	36s. — 40s.	
———	English	42s. — 44s.	
———	American	44s. — 50s.	p. 240 lib.
———	Irish	— — —	
Oats,	Irish mealing	22s. — 24s.	p. 264 lib.
———	Ditto inferior	18s. — 20s.	
———	Scotch potato	24s. — 25s. 6d.	p. Renfrewshire boll.
———	Ditto small	20s. — 21s.	
———	English potato	24s. — 25s	p. Stirlingshire boll.
———	Ditto small	— — —	
Barley,	English,	33s. — 34s.	p. ditto ditto.
———	Scotch,	25s. — 28s.	

Grech

Green Peas, English	26s. — 27s.	p. Stirlingshire boll.
——— Scotch	23s. — 25s.	
Beans, English,	26s. — 28s.	p. ditto ditto.
—— Scotch,	23s. — 24s.	
Flour, Fine -	15s. — 18s.	p. sack of 280 lib.
Oatmeal, Scotch	22s. — 22s. 6d.	p. boll of 140 lib.
——— Irish	15s. — 18s.	

Letter from Falkirk, August 2.

'THE rains continuing exceſſive for ſome time after laſt report, ſummer-fallows were thrown far behind, and can ſcarcely be expected to be perfectly executed this ſeaſon under any ordinary exertion. Hay harveſt, in this diſtrict, has been finiſhed pretty favourably, and the crop got up in good order; much of it having been put into tramp ricks, or into the ſtack, without almoſt any rain. The crop is a fair one, but by no means equal to what was once expected. The price not ſuch as will put much money into the pockets of the farmer. Eightpence per ſtone is ſpoken of; but few bargains have yet been made. Of late years, the hay crop has paid very ill, the quantity appearing to be above the demand. This, therefore, is likely to continue, until ſome ſyſtem of conſuming it advantageouſly on the premiſes, becomes much more general than is the caſe at preſent in this diſtrict. To diminiſh the cultivation of the artificial graſſes, would be to injure materially good farming.

'The idea given of our corn crops in laſt report, is likely to turn out pretty correct. Wheat, ſince that time, has mended conſiderably, but ſtill will not reach an average crop; but, having paſſed favourably through the bloſſoming proceſs, appearing free from every kind of diſeaſe, and not being lodged, the quality may be expected good. Barley the worſt we have had for many ſeaſons; Oats pretty good; Beans moſt excellent, exceeding any crop for ſome years paſt. Upon the whole, the bulk in the ſtack-yards will probably be below par, however the quality may turn out to make up that deficiency. Potatoes are here on a ſmall ſcale; they are very generally bad. With dry weather, we ſhall have harveſt about three weeks hence.

'Our grain markets have mended a little ſince laſt report, but ſtill are far from being briſk. They ſeem not yet to have recovered the craſh that took place laſt winter among the bakers and corndealers. Wheat of 62 lib. per Linlithgow firlot, about 38s. per boll. This, with the other extraordinary circumſtances of the times, have wonderfully moderated the late extravagant notions of the indefinite value of land, and we now begin to think more ſoberly on that ſubject; although, like the depreciation of our paper currency, it is by many moſt unwillingly admitted. The ſubject of depreciation having been particularly diſcuſſed as connected with the payment of rent, becomes intereſting in an agricultural point of view. That it would have manifeſted itſelf moſt unequivocally to the ruin of many tenants, had the legiſlature not interfered, there can ſcarcely be a doubt. Although, during the currency of a leaſe, at leaſt in ordinary times, no other payment but that ſpecified in the contract

tract ought either to be exacted or refused, yet, at every renewal, the landlord may stipulate for the rent in kind;—no uncommon mode of payment, and against which, though strong objections exist on the part of the tenant, there are scarcely any on that of the landlord. This appears a very easy way at least, in time coming, to guard against the contingency of payment of rent in depreciated paper. Other difficulties, of great magnitude, arising from this source, are not so easily surmounted by any legislative enactments. It is truly astonishing to what heights of inconsistency even intelligent men are carried by favourite theories. Those who maintain, that we can go on equally well with a paper currency, not referable to any settled standard, as with a metallic, have surely never once adverted to the frightful calamities that would inevitably ensue under such circumstances, in the event of the recurrence of such deficient crops as those of 1799 and 1800. If, during the healthy state of our currency, and our ordinary relations with foreign states, it has hitherto been found impracticable to obtain considerable supplies of foreign grain, without large cash payments, what reason have we to suppose, that, in the present deranged state of both, the evil would not be mightily aggravated? It is truly terrifying to contemplate the possibility of such a visitation, when we, at the same time, look to the wonderful increase of our population, as appears in the returns from almost every district, and the still greater increase of luxury, imperiously demanding larger supplies of food for the same number. One self-evident practical inference may be drawn from this picture,—a fostering encouragement to our own agriculture, as the alone means to obviate or mitigate such a dreadful crisis. Crops, now-a-days, even much less scanty than those alluded to, would produce infinitely greater distress.

'In answer to the queries of the Mid Lothian Reporter in last number, it may be stated, that, in Stirlingshire, no tenant, whose rent is not 100l. per annum or upwards, if he has no other source of income, is assessed to the Property-tax; nor, consequently, to the maximum of that tax, unless his rent is 300l. or upwards. Nothing can be more simple or plain, however unjust, than this part of the act, that a tenant's income is taken as equal to half his rent, and that no income from labour is taxable under 50l., or liable to the full 10 per cent. unless 150l. or upwards.—In answer to the 2d query, the charge made on plantations is strictly in accordance with the act; is therefore the law of Great Britain, however inconsistent with equity; and its equity is certainly very questionable.

Aberdeenshire Quarterly Report.

DURING the last three months, the weather has been, on the whole, favourable to agricultural purposes. The hay crop, which is considerably above an average, has been secured, at least in the tramp ricks, in the highest state of perfection; but turnips, which were got sown in as promising a way as could be desired, from excessive drought at seed-time, and the cold northerly winds which have since prevailed, are, upon thin soils and exposed situations, very imperfectly planted. The potato crop is rather backward; but, if the remainder of the season proves favourable,

favourable, may do well ſtill. Flax or lint has been very generally, and pretty extenſively, ſown this year; and the crop looks exceedingly well on the ground. The few fields of wheat in this diſtrict are good, and promiſe an equal and fair return. Oats are full on the ground, promiſe to be rich in grain, and of good quality, as they are far advanced, and will be early ready for the ſickle. Bear is not ſo full a crop, and will not yield ſo great a return in point of quantity; but, being early, will in all probability furniſh grain of good quality. Paſture graſs came early, and has yielded a full bite through the ſeaſon; ſtock are therefore generally in excellent order; and prices, ſince they ſtarted in the month of May, have been ſteady, and the demand good, with little interruption. Beef 9s. to 10s. per ſtone Amſterdam, ſinking offal; Mutton much the ſame. For oatmeal there is little demand, and prices have experienced very little alteration ſince laſt report. Oats are rather in more demand, and the price advanced from 18. to 2s. per boll; that is, they may be quoted from 16s. to 19s. Bear and barley are alſo in request, and may be ſold from 22s. to 27s. per boll; but, of this ſpecies of grain, there is not much remaining on hand. The price of labour advanced conſiderably at laſt term; and hands for carrying on the operations of huſbandry are rather ſcarce.——*Aug.* 3.

Fifeſhire Quarterly Report.

After a long tract of wet weather, which prevented much barley from being ſown, and injured other crops, fine warm weather ſucceeded, and ſtill continues, which in a great meaſure has recovered the crops that otherwiſe would have been very indifferent, and admitted the fallows to get forward, and to be duly cleaned. The hay crop was got up in excellent order, in leſs time after cutting, and at much leſs expenſe, than uſual; and the turnips ſown under favourable circumſtances, have come away equally, and offer to be a good crop. The preſent appearance of the crops, at this date, within the county, generally, are as follows:

Wheat rather thin, but a full head; noruſt or mildew as yet has appeared; any injury ſuſtained being from the high winds, which broke the ſtraw, and looſened the roots, ſome weeks ago; and it is apprehended, the loſs from this cauſe, may amount to not leſs than one boll per acre.

Oats, on dry land, much above an average crop; being thick, heavy and good, plenty of ſtraw, and a full ear: But in wet lands (except after graſs ploughed up) they are very poor, eſpecially thoſe not harrowed in before the wet weather came on. The quantity in this ſituation was not great; ſo that the oat crop, on the whole, may be conſidered as above an average one.

Barley, from the ſame cauſes, failed upon wet land; but, on dry land, early ſown, it is extremely good, and, on the whole, may be taken as an average crop.

Potatoes.—This crop has ſuffered more than any other, from a wet ſeedtime and continued rains. In many fields the ſeed rotted almoſt wholly, in others partially. In all lands, not very dry, they will

not

not turn out equal to one-fourth of last year's crop. Even upon dry ground, they are much inferior; and, on the whole, the quantity of potatoes, it is probable, will not prove much more than half of last year's produce; nor is the quality likely to be so fine.

Peas and beans, extremely good, and much superior to the two preceding crops; indeed considerably above an average.

Flax, not inferior to last year's crop, which turned out better than any for the seven preceding years; and both these were chiefly from seed saved within the kingdom, little foreign seed having been sown in these years.

Hay, in great abundance, and may be rated about 200 stone per acre, but not much demand for it. The purchaser offers 6d. per stone; and the farmer, finding that inadequate to his rent and expense, appaers unwilling to dispose of it, unless impelled by necessity, as some have already been. The prices of victual continue to remain steady; but the market is so dull, that much grain remains a drug on the hands of the farmer, gradually involving him in distress.

From these and other causes, many already find it impracticable to pay the rents promised a few years ago; therefore, a considerable fall of rents appears inevitable. Proprietors are begun to be more cautious in selecting skilful and substantial farmers, although not the highest offerers, as from such alone, under the circumstances of the country, have they a prospect of getting the rent agreed upon regularly paid.—*3d August.*

Berwickshire Report from May 29. to August 3.

The weather during this quarter has been showery, and the temperature rather low for the season. Turnip sowing was frequently interrupted by the rains; and, from the same cause, many fields came to be sown in an imperfect state as to cleanness. The first hoeing is now nearly over; and, on good turnip soils, the crop has a promising aspect; but on cold land the plants were long in coming to the hoe. Wheat fallows were sadly overrun before the conclusion of turnip seed, and are, in many cases, still so far behind, that there seems little probability of their being got thoroughly clean this season.

Spring wheats promise well, but winter wheats are thin and rather weak. Barley will be a light crop, particularly on retentive bottomed land. Oats, though good on all the soft and free soils, are exceedingly thin and sickly upon the clays. Peas and beans are luxuriant, but have sustained considerable injury from a high gale of wind on the 23d ult. Hay harvest is far advanced, and the crop is in general good: The selling price from the rick has been about 6d. per stone of 22½ lib. avoirdupois. Upon free soils, the potato crop looks well; but, in the clay district, it is blanky, and by no means promising; many of the sets having perished from a superabundance of moisture.

The wool market has been dull, and a good deal still remains unsold: long wool has been selling at 20s. and 21s. per stone of

24 lib. avoirdupois, being from 16 to 20 per cent. below the rates of last season. Lambs of the new Leicester breed have brought fully last year's price, but Highland lambs have sold lower. Pasturage has been very abundant; in consequence of which lean cattle have all along met with a ready market. Fat has remained pretty steady. Beef from 7s. to 8s. per stone, sink; and mutton from 7d. to 8d. per lib. ditto, avoirdupois weight.

Corn markets have made a trifling advance since last report. At Berwick market this day (Aug. 3.) prices were—Wheat 54s. to 62s.; Barley 24s. to 26s.; Oats 16s. to 20s.; and Beans 26s. to 28s. per boll of six Winchester bushels.

East Lothian Quarterly Report.

THE corn crops of this county, as to quality, were seldom more diversified, being full and weighty upon all the light soils kept under proper management; whereas, on cold and wet soils, the stalk is generally small and sickly, the ear lean and feeble—in short, upon all soils of the last description, none of the crops will be weighty or abundant. But, what is worse, there is reason to suppose that the wheats upon wet lands suffered most during the late gales of wind, being, from the weakness of straw, less able to resist the force of these tempests. In consequence of that weakness, many wheat fields of late seem to have fallen into a kind of decay; while others, from being loosened at the root, look as if the process of ripening was going prematurely forward. Indeed, the stalk of the plant was, in numerous instances, so much broke down by a gale of wind on the 25th ult., and the ear so lacerated and injured, that a heavy loss must necessarily follow. The extent of that loss cannot be estimated; though those who remember the consequences which followed the high gale that occurred in the same week of July 1786, will readily acknowledge that it must be considerable.

Barley, upon all barley soils, is universally good; indeed rather too strong, as otherwise; from which circumstance the grass seeds sown with it may suffer greatly. Oats, with the exception of those upon thin soils, are also a full crop: and beans and peas are, generally speaking, superior to the crops of the four preceding years. Indeed, with respect to barley, oats, peas and beans, the crop exceeds an average. As to wheat, a more restricted opinion must be pronounced. There are many fine fields of that grain through the district, but chiefly on the warm dry lands of the coast side, where the crop flourished and prospered in May and June, when it was drenched with moisture upon the clay lands. The best field of wheat in the district is upon the farm of Amisfield Mains, possessed by Mr Alexander Brodie. A part of that field was last year completely summer fallowed and dunged; and the remainder carried potatoes and turnips. The field was sown at three periods, viz. about the middle of September, the end of October, and early in spring. All of it is good, though the part sown in spring is apparently of smallest

smallest bulk. In a word, taking the district as a whole, and holding in view the injury done by wind to many fields, it is presumed the wheat crop may be estimated as below what is obtained in an average of seasons. No doubt, much depends upon the state of weather till the crop is harvested. If the weather is sunny, dry and calm, the grain may be considerably improved, both as to quantity and quality; whereas, if wetness follow, the best fields will suffer the greatest injury.

At the date of last report, small progress had been made in the sowing of turnips; but the weather having settled about the middle of June, every nerve was instantly strained to execute that important process. With every exertion, few people had completed their seed-work at the first of July; and some were even sowing so late as the tenth of the month. As there was no want of sap at the time, and as a succession of genial rains speedily followed, a pretty regular braird was generally obtained; but unless a genial and temperate autumn ensue, it can hardly be expected that the plants will be so well rooted as in seasons when the seed is earlier sown.

Hay turned out better than was expected, and is now selling at 8d. per Scotch stone from the rick. Pastures have yielded a full bite, and promise to do so through the season. The grazing trade cannot, however, be a good one this year, as the stock was by far too high purchased.

Markets for wheat and barley seem to be on the advance; there not being a great quantity of either on hand. Oats are more plentiful; and a decent supply of beans and peas has regularly appeared. The butcher market has always been well supplied with fat cattle at from 10s. to 10s. 6d. per stone, sink; with sheep at nearly the same prices. Wool may be reported as almost unsaleable; and, so far as is known, no price has been made for any that has been delivered.——*Aug.* 6.

P. S.—*Aug.* 16.—Since the above was written, it is completely ascertained that the wheat crop will be a deficient one; though as yet it is impossible to speak with precision concerning the extent of the deficiency, especially as much depends upon the nature of the weather till the crop is harvested. At this time the weather is highly unfavourable for maturating the grain. Hence, as the cups of the ear which contain the grain are imperfectly filled, while the ear itself is generally much shorter than usual; the probability is, that the crop will not only be greatly deficient as to quantity, but that the quality of the grain produced will also be considerably below what is raised in an average of seasons. On these accounts, the price of wheat is rapidly advancing.

It was omitted to state in the above report, that on the farm of *Scateraw*, possessed by Mr John Gray, there is the largest and best field of beans in the district—perhaps in the whole island. This field is said to consist of seventy Scotch acres, upon which one hundred bolls of beans were drilled; and the appearance of the field proves that

that the processes of drilling and hoeing have all been well executed; so much so, that garden culture can seldom be considered as superior to the culture bestowed upon this beautiful and extensive field.

ENGLAND.

Letter from Thetford, July 27.

'Our wool fair was not very numerously attended, either by buyers or sellers; consequently, the business transacted, was inconsiderable. The dinner chair at the George Inn was, as usual, taken by Thomas Wm. Coke esq., supported on his right and left by the Earls of Albemarle and Bristol, Messrs Howard, Moseley, A. Hammond, Postle, Allen, Denton, Mingay, Thorpe, Dillingham, Beck, Butcher, Kirbell, Fowell, Oakes, and many other distinguished agriculturists and growers of wool. After a handsome dinner and desert, Mr Coke opened the business which this meeting had in view, by stating, that he was sorry not to have it in his power to give the company present, better information respecting the prices of wool, which he found were much depreciated since last year, owing, in a great measure, to the want of commerce, confidence in each other, and to the want of money. The Chairman then said, he regretted that the object of this meeting was considerably frustrated, by farmers sending their wool into factories without fixing a price, which materially counteracted this establishment, and was a means of furnishing the manufacturers with a partial quantity for the present, and thereby rendering their attendance discretionary at this annual mart. He sincerely hoped that such gentlemen farmers, many of whom he saw present, would desist from such conduct in future. The object of their present meeting was to obtain a fair price for wool; but he found the premature delivery thereof had much increased since this Fair had been altered to a later period, (as Messrs Fyson's yards and granaries would then show); therefore he was instructed to suggest an earlier day in future for this meeting, which would hereafter be held on the Saturday preceding Broomhill Fair, the 7th of July. Mr Coke then offered his own wool at 56s. per tod, or 2s. per lib., which he was induced to do by way of example; but declared he would not sell it for that sum after he had quitted the room. No one, however, closed with those terms; and the Fair, altogether, was reckoned the dullest since the period of its first establishment.

'A Yorkshire clothier present, said, that if the wools were better selected and sorted, the manufacturer might afford a superior price for some over others; but as flocks were now frequently blended together by the commissioned buyers, an adequate price might not in some instances be obtained. He therefore recommended a more careful selection of the qualities of the wool, as the best means of insuring a fair price and ready sale.

'At the above wool fair were exhibited two prime Merino ewes with their lambs, the property of John Thorpe esq. of Chippenham Park. Their extreme beauty, symmetry of shape, and excellent condition, were much admired, and induced many to alter their opinion in favour

of that excellent breed of ſheep. A ſpecimen of ſcoured Merino wool, grown in Saxony, was contraſted with Merino wool grown at Chippenham, to the evident advantage of the latter; and a piece of cloth, manufactured in Yorkſhire, from Mr Thorpe's wool, by Mr Edward Harling of Almondbury, near Huddersfield, was extremely admired, as equal to the Weſt of England manufacture. The attention ſo aſſiduouſly paid at Chippenham Park to the growth of fine wools is well known; and the public will be gratified to hear, that the wool-bearing animal, the Llama, has there produced a young one, which is the firſt ever known in theſe kingdoms, and perhaps in Europe.'

Letter from London, July 29.

'I WAS down through the hundreds of Eſſex laſt week, and, as I went along, examined the wheat crops minutely; but did not find much mildew, except where the crop was thin. The harveſt is now begun, and a good deal cut down; and, from the obſervations I made, the wheat, barley and oats are very good crops; beans and peas very indifferent indeed; the former is very ill corned, and greatly deſtroyed by what they call the collier, and the latter by lice. I am certain, if there is the uſual demand this year for theſe grains, they muſt advance greatly in price, as there will not be half a crop of them.'

Letter from Wales, July 29.

'THE weather during this laſt quarter was unfavourable to huſbandry, as we had rain for upwards of ſix weeks, viz. from the end of April till the month of June, which cauſed all field labour to ſtand ſtill. Many farmers had not finiſhed ſowing barley at the end of May, by which time fallows were in ſo bad a ſtate, that we have not yet been able to bring them round. The turnips were moſtly ſown in a ſlovenly, bad way; and ſome people are only now about finiſhing them. We have enough of plants upon the early ſown fields, but they look weak and ſickly, the land being foul; ſome of theſe have been hoed, and begin to look better, but I ſee none that look well. Our crops of hay are, in general, very great; and thoſe cut were well got, though there is ſtill a great deal uncut and in the fields. The weather appears at preſent to be ſettled, which, if it continues, will allow moſt of the hay to be ſafely harveſted in the courſe of next week. Our corn, on all the gravels, and dry, ſound lands, is looking well; but has failed on the wet clays and ſpringy fields. Some fields of peas will be cut in the courſe of next week; but we ſhall have no general harveſt for a fortnight or more. Corn Markets are ſtill dull; wheat rather on the advance than otherways. Freſh ſupplies from the North almoſt every week, although of an inferior quality, fill the market; and the appearance of the crop being better than laſt year, thoſe that kept their wheat have been diſappointed much. Beſt wheat laſt week 34s. for 168 pounds; Barley from 15s. to 17s. for 21 gallons; Oats from 14s. to 16s. per quarter: No other grain at market here at preſent. Black cattle, both fat and lean, have ſold readily, and at good prices; but ſtore ſheep and lambs are ſelling conſiderably

under what they were last year. Wool is a drug: what has been sold is at a very reduced price. We have a good appearance of potatoes; but very little fruit of any kind, as the orchards have generally failed. Land rent is still on the advance; although things last year went much against the farmers, particularly where their dependence was on corn.'

Cumberland Quarterly Report.

THE hay harvest this season has been the most abundant known for many years. Both sown grasses and meadow hay have, in general, been secured in excellent order. The cutting of barley has partially commenced at Wetherhall near Carlisle, and at Canonby near Mary Port; and in three or four weeks the harvest will be general. The barley cut near Carlisle is spring barley, sown early in March; the barley, or rather big, cut near Mary Port, was sown in September, and is generally termed winter barley. It was first introduced into this county by J. C. Curwen, Esquire. Early sown barley promises to be a good crop; late sown is uniformly indifferent. A considerable quantity of barley was sown in June, on heavy soils, in consequence of long continued wet weather. The sown clovers and grass seeds promise favourably. Oats in general are good, and the chief cause of their being superior to barley is, that, in Cumberland, the season for sowing oats is earlier than for barley. Heavy soils, with retentive subsoils, have produced but indifferent crops, either of wheat, barley, or oats. Gravels appear as if *scorched*, and this *universally*. Potatoes, which are at least nearly one half of this year's crop, look extremely ill. Crows, or rooks, have injured the early potatoes very much. Early sown turnips are good. Wheat promises to be an average crop. The most numerous failures of this valuable grain, are on retentive soils, where the season of sowing was late, and where clover lea was the preparation for sowing. But instances are not wanting of well managed fallows disappointing the hopes of the farmer, in consequence of that fermentation which a too liberal application of lime to summer fallows almost uniformly produces, (as per Survey of East Lothian, *Art. Wheat*). Mr Curwen's crop of hay is very good. His wheat sown after paring and burning, is uncommonly strong. Part of his wheat sown on *clover lea* in spring, on a dry soil, where a compost of coal sill (schistus) and lime was liberally given, promises well. It would have given great satisfaction, if his wheat crops, on strong soils, after clover, had deserved equal praise. His wheat, after potatoes, was sown too late. It is not probable the Cumbrian farmers will be induced, in consequence of Mr Curwen's trials, to adopt the Norfolk system on heavy soils. Every agriculturist must be highly gratified with observing, that Mr Curwen has stimulated many farmers to be more circumspect, in cleaning their fallows and fallow crops,—that he has been the cause of extending summer soiling,—of introducing winter barley, big, or bear,—of inducing his own farmers, and many others, to purchase

the short-horned stock, and to improve their breed of sheep. But, though he has done all these things, he has not influenced a single farmer to sow wheat without brining: in this instance, the result of the *practice*, uninfluenced by any theory, is wisely attended to. Mr Curwen deserves the highest praise, for his unqualified approbation of leases. Farmers, here, still continue to give high rents. The *system* of many landlords, of valuing their estates by their *stewards*, then letting by *private* proposals, thus *screwing* up their farmers, has been very recently adopted by an extensive landed proprietor in this county. When shall we behold those manly, open, disinterested methods, pursued universally by landed proprietors, which have secured so high a character to Coke of Holkham? Until this is done, societies may be formed, presidents may publish, agricultural knowledge may be disseminated,—but good farmers can never be expected.—*29th July.*

Northumberland Quarterly Report.

THROUGH the months of June and July, the weather was alternately dry and wet, the latter (mostly attended with cold) of no long continuance, or in too great abundance, which has been favourable to vegetation in general. The hay crops upon old grass land are abundant; but the sown grasses cut up light, owing to a deficiency of clover, which was destroyed in the winter and spring. The corn crops upon dry soils have every appearance of great bulk, but upon clayey and moist loams they are, in general, very thin, with small heads and short straw. There is not yet any perceptible indication of those diseases which have been so injurious to the wheat crops of late years; but as the harvest will be late in this district, some of them may yet take place. Turnips and ruta baga are every where looking healthy, and growing vigorously; and as the seed was put in under favourable circumstances, while the soil had a due degree of moisture, it vegetated equally and immediately: the late warm weather has tended much to accelerate the growth of the plants, and they have met with little or no check from the fly, which insect, however, attacked some fields for a few days at the latter end of June; but the cold misty weather, the first week in July, seems to have destroyed them, as none were seen after that period. The fallows that were so far back at the date of last report, are now getting into tolerable condition; and if the next month proves dry, will be made perfectly clean against wheat seed time.

The markets for lean cattle have been good, there being a great demand to the southward; for sheep they have been ratner lower. At Whitsunbank Fair, the prices for long-woolled hogs were from 35s. to 40s. At Yetholm Fair, long-woolled lambs were from 16s. to 20s. and Cheviot lambs from 9s. to 12s. The prices for fat stock at Morpeth continues much the same; Beef from 7s. to 8s. per stone of 14 lib. sink; Mutton from 8d. to 8½d. per lib. sink; and Lambs from 16s. to 24s. per head.

The wool trade is very flow, and prices confiderably lower than laft year; from 20s. to 21s. per ftone of 24 lib. is offered for long wool, and

and 28s. to 30s. for Cheviot wool; which is 4s. and 5s. per ſtone leſs for the former, and from 15s. to 20s. leſs for the latter, than was given laſt year.——*July* 31.

Yorkſhire Quarterly Report.

In one reſpect, at leaſt, the fine promiſes of laſt report have been diſappointed, that is, in the preſent appearance and condition of the bean crop, which was then luxuriant and flattering in the higheſt degree: a ſad reverſe has unfortunately occurred, by the prevalence of that terrible ſcourge, the black louſe or collier inſect; the ravages of which may in ſome degree be compared with thoſe of the locuſt. Some whole fields are nearly, if not quite deſtroyed; many are materially injured; and few, indeed, have eſcaped without conſiderable loſs.

The wheat crop is generally flouriſhing, and has now taken on the appearance of a good bright yellow, approaching faſt to a ſtate of ripeneſs. Some rye near York was cut near a week ſince; and probably grain of various ſorts will be cut in different parts of the county in a week or ten days hence. Barley is ſuppoſed unequal to the crop of laſt year, but is ripening very faſt in this uncommonly fine weather. Oats are generally eſteemed a much better produce than laſt year. Peas are abundant in ſtraw, and pod well; and the inſect ſo deſtructive to beans ſeems not at all to affect them; for they are prolific even among the damaged beans that were ſown with them.

The price of beſt wheat is at preſent about 11s. 6d.; Oats 4s.; Barley 5s.; Rye 6s. 6d.; and Beans 7s. per buſhel of Wincheſter.

Many turnip fields are very promiſing; and, though not quite ſo well fallowed, as the complete cultivation of that uſeful root requires, yet with careful hoeing and ſubſequent attendance, they may probably turn out of good average produce. The proportion of the Swediſh turnip is annually increaſing.

The clover and hay crops have been abundant, and uncommonly well harveſted; yet much damage has been ſuſtained in the flatter parts of this county, from the heavy rains of the 21ſt and 22d inſt. and the enſuing floods. The beſt hay is now not more than 5*l.* per ton.

Rape and flax are by no means defective, and the young clovers and ſeeds, in general, are growing in great perfection.

Summer fallows are ſtill in a backward condition; and, without a continuance of fine weather, will not be very well prepared this ſeaſon.

Paſtures continue in a rich feeding ſtate; and lean ſtock is in proportionate demand. Fat cattle and ſheep are readily ſold. Beſt Beef 9d.; Mutton, Veal and Lamb at 8d.; and Butter 1s. 4d. per lib.

Potatoes fully ſupply the markets; and this crop, in general, is likely to be plentiful. Horſes are declining in price. Pigs alſo are lower.

Wool ſells heavily, at a conſiderable reduction of laſt year's prices. The preſent depreſſed ſtate of that trade in particular, is a complete refutation of the falſehoods of deſigning men, who inſult us with aſſertions of the proſperity of the country. But little more is wanting to render this country utterly unable to bear the exceſſive burdens now impoſed upon it. For without good and even high prices, which can only conſiſt with the

the correſponding ſtate of trade and induſtry in general, the taxes cannot long be raiſed in their preſent enormous extent. Some alarming ſymptoms already appear; but nothing will convince ſome people of the error of their ways—thoſe at leaſt who imagine themſelves intereſted in exhauſting a nation—no, not even were 'one raiſed from the dead' for that purpoſe.——*Aug.* 1.

Extract of a Letter from Cleveland, August 2.

'THE weather, during a conſiderable part of the month of June and July laſt, was wet and cold. It has conſequently had rather an injurious effect upon the corn crops of the cold-bottomed lands; the fallow proceſs has been retarded, and much of the early mown hay has been injured. The growth of the turnip was checked by the ſame cauſe, although it eſcaped the ravages of the fly. Within the laſt fortnight, however, the weather has undergone a very favourable change, and has operated very beneficial effects to the agriculture of this diſtrict. The corn on good land did not ſuffer much from the cold and wet weather that prevailed during the two laſt months, and now aſſumes a very favourable aſpect. Upon the whole, the wheat, beans and oats of Cleveland now promiſe to equal the crop of laſt year, and to exceed the average of former years. If the preſent fine weather continues, a good deal of the wheat will be ready for the ſickle in a fortnight, and ſome will be cut ſooner. The demand for wheat during the laſt three months has remained very ſteady, and the price has not varied materially. The average may ſtill be quoted at 10s. per Wincheſter buſhel; Beans at 7s.; and Oats at 3s. The demand for fat cattle has been ſteady; and the medium price may be quoted at 8s. 6d. per ſtone of 14 lib. avoirdupois, ſink; Mutton at 8d. per lib. The paſtures have been, and ſtill continue, in general, full of graſs; and the fog will probably be good, ſo that graziers are in no haſte to ſell; and the prices of fat cattle and ſheep will moſt likely continue ſteady during the ſummer.

Leter from a Gentleman in Wiltshire, August 5.

'THE weather for the laſt three months has been generally very favourable, although on the 28th of May we had a remarkably heavy ſtorm of thunder and rain, which was injurious to the few turnips that were then ſown, and probably may produce a bad effect on the bean crops, which are generally thinly *kidded*, and ſhow ſome appearance of blight. The wheats alſo, in general, are ſomewhat blighted, and, in ſeveral parts of the country, have ſuſtained much injury from that cauſe; yet, upon the whole, the crop will not be found very defective. Barley and oats promiſe well. Some of the earlier ſorts of peas have been harveſted, but the crops in general are but middling. The late ſown vetches have produced a very abundant ſupply of green food for ſheep, &c.

Graſſes, both natural and artificial, have been very productive, owing perhaps to the rains during May, and the early part of July, which, however, made hay work a difficult buſineſs, eſpecially as the crops were heavy. A conſiderable quantity muſt have been put together in bad order, though the early cut graſs was certainly well made.

From the variableneſs of the weather at ſeed time, turnip land could

not

not be got prepared in a ſuitable way, therefore much of it was ſown in a foul ſtate; notwithſtanding which, the plants in general look well, not having experienced much injury from the fly. The dry weather latterly has been very opportune for the purpoſe of cleaning ſummer fallows, drawing out manure, and has brought on the wheat fine and faſt. In the higher parts of the county ſome began reaping about a fortnight ſince, and, in a few days, the wheat harveſt will be general.

Lean cattle, at the fairs in this diſtrict, have commanded high prices, and lambs have ſold at a very conſiderable advance. Wool is ſtill a dull article.

Average price of Grain per Quarter in Devizes Market.

1811.	WHEAT, *p. Qr.*	BARLEY, *p. Qr.*	OATS, *p. Qr.*	BEANS, *p. Qr.*
June	88s. 3½d.	40s. 0d.	28s. 9d.	24s. 0d.
July	89s. 7d.	40s. 6d.	29s. 0d.	24s. 0d.

Letter from London, August 5.

'We have not had many arrivals of foreign grain through the ſummer; but our ſupplies coaſtways have been tolerably good, though ſeldom greater than what was demanded. The quantity of wheat preſented this morning, was ſmaller than uſual; which circumſtance, added to the reports in circulation concerning the diſeaſed ſtate of the wheat crop in ſeveral diſtricts, together with the inferior quality of the new grain that appeared at market, occaſioned a riſe of fully 6s. per quarter. There has not been much done of late in the barley trade; and as for oats, the market has been regularly ſupplied at prices not very different from thoſe formerly reported. With beans, there has been little variation.

Our accounts from Kent (a diſtrict on which the wheat market greatly depends) bear, that the wheat crops are ſeverely blighted, and much lighter than uſual. From Eſſex, the information is far from being favourable; and from Norfolk, that mildew had generally appeared, though in different degrees, upon wheats which ſtood upon light ſoils. Indeed, there is ſome reaſon to believe, that the wheat crop will be a ſhort one as to quantity, and vaſtly inferior as to quality, when compared with what was produced in 1810.

Smithfield market has been well ſupplied, through ſummer, with beaſts, ſheep and lambs; and prices, of late, have rather fallen. Clover-hay ſtill maintains a good price, viz. from 7*l.* to 8*l.* per load, though it was lately expected to be lower. Potatoes are a plentiful article; and as to wools, either Engliſh or foreign, there is little doing; therefore not much alteration in prices.'

State of London Markets, Monday, August 5.

Wheat, White,	80s. to 103s.	All per quarter of 8 Winchester buſhels.
—— Red,	72s. — 97s.	
—— Foreign,	70s. — 98s.	
Rye,	36s. — 42s.	
Barley, Engliſh	30s. — 39s.	
Malt	65s. — 72s.	

Oats,

Oats, Feed, - - - -	18s. —	22s.	All per quarter of 8 Winchester bushels.
—— Short, - - - -	21s. —	26s.	
—— Poland, - -	23s. —	30s.	
—— Potato, - - -	28s. —	33s.	
Beans, Pigeon, - - -	46s. —	50s.	
—— Tick, - - - -	38s. —	42s.	
Peas, Boiling, - - -	50s. —	56s.	
—— Grey, - - -	38s. —	47s.	

Flour per sack, Fine, - 85s.

—————— Second, 75s. — 80s.

Tallow, - - - - - - 3s. 8d. per stone of 8 lib.

Quartern Loaf—Wheaten, 13¾d.;—Household, 12¾d.

Letter from a Gentleman in Bedfordshire.

'The wheat harvest is in great forwardness, and in a few days, little will remain unreaped. There are certainly some prime crops, but many very thin ones: in short, wheat, in general, is lighter in hand than last year; and if we do not obtain a shower to fill the kernel, it will be less plump than usual. Those parts of the county that are subject to mildew, are again affected by it, and, in many places, the straw is not free from the red-rust: yet, the effects of this disease are neither so general, nor so pernicious, as we have frequently witnessed. Barley never depended more upon cultivation than this season. We observe a progression of crops from the finest to the worst, according to the nature and condition of the land; though here and there some exceptions will occur, as it were, by accident. The fly began to leave the beans about the middle of July, and was effectually cleared off by a heavy and lasting rain on the 20th: The damage done by this insect cannot be estimated at less than half the crop. It were worth inquiry, from whence does this fly origiuate? Are there any means to prevent it, or lessen its ravages?—As far as our observation goes, we have only two points to notice. Those beans that were put in earliest, and had in a great measure *kidded* before the general prevalence of the fly, have for this reason stood it best. And, secondly, where there has been an admixture of peas, forming altogether a thick and close cover, the fly is only found on the surface, and appears to require the free admission of air; and though, in general, thick crops of beans and peas mixed, or beans only, are deficient in fructification, yet, in this particular case, they are more protected from this noisome and destructive insect.'

Letter

Letter from Haddington, August 12.

'In these times, when the business of setting land is almost at a stand—when proprietors will not ask, and few farmers seem disposed to offer rent, a scheme has been devised for bringing the parties to a better understanding, excellently calculated to benefit agriculture, and to promote the welfare and comfort of those concerned in it. The scheme alluded to, is to leave rent to be settled by arbiters mutually appointed—in which proprietors have every reason to believe that a fair rent will always be awarded to them, while tenants have cause to rejoice at being thereby saved from all those tricks played off in former times, by greedy proprietors and cunning agents, to squeeze the last penny from them. On these accounts, this new way of setting land is warmly recommended to public notice. Much praise is due to the gentleman who devised such a scheme; and were it extended to the *conditions* of set, the tenantry would gradually be released from all the useless and burdensome restrictions too often introduced into leases, by which their operations are perplexed and obstructed, while the interest of the proprietor is little, if at all, thereby advanced. In short, if persons of skill and capacity were appointed to settle these matters, the conditions of a lease would always be in unison with the state of husbandry at the time, and not be copied from one generation to another, as hitherto has frequently happened.

[The following account is taken from the newspapers. We wish it may prove true; as hitherto far less attention has been paid to the Scotish Fisheries than what their importance merited.]

Upwards of eight hundred Dutch fishermen have recently made application to the British Government to be taken under its protection, and have solicited to be allowed to settle on some part of the east coast of Scotland. The situation of these poor men is truly pitiable; the unsettled state of the Continent having deprived them, for a long time past, of the means of pursuing their peaceful occupations with either safety or success. We are glad to learn, that Government are now devising measures for procuring a permanent settlement for these useful and industrious people on some part of that coast; and, it is understood, that the late visit of the Governors of the Merchant Maiden Hospital of Edinburgh, to the town of Peterhead, was connected with this object. To any one acquainted with the inoffensive disposition and frugal industrious habits of the Dutch fishermen, it is needless to point out the incalculable advantages which such an acquisition will be to that quarter of the island. They are infinitely better acquainted with the fishing banks and stations upon the coast than our own fishermen; and the patient labour and economy with which they pursue their occupation, must render them valuable members of any community. The great body of these fishermen has already arrived at Heligoland; and many others, on various parts of the Dutch coast, are prepared to follow their example.

NOTICES

NOTICES TO CORRESPONDENTS.

The letter from R. A. *concerning the Manufacture and Use of Iron Gates*, is poſtponed till next number. It was inconvenient to preſent the figures at this time; therefore it was judged adviſeable to delay the letter till an engraving of the figures could be executed.

As the *Fifeſhire Ploughman* has not tranſmitted the promiſed paper on the Huſbandry of that diſtrict, as requeſted in our laſt, his firſt communication is, of courſe, held on till our requeſt is complied with.

Little being known of the huſbandry of the iſland of Bute, we are extremely obliged to the gentlemen who have kindly favoured us with an account of the preſent ſtate of Agriculture in that Iſland; and ſhall take the earlieſt opportunity of preſenting it to our readers.

The remarks of 'A Friend to Flax Huſbandry' on Cultor's Eſſay on Premiums, ſhall have a place.

We have not had leiſure to examine the letter ſigned T. C. containing obſervations on the anſwers of a Farmer to the queries of Sir John Sinclair. Mr T. C. in the calculations he is pleaſed to make, proceeds upon a principle which ſeldom can be carried fully into execution; viz. that the farm, to which the anſwers relate, might be managed according to one uniform or regular courſe of cropping. Now, we can aſſure him, that the farm in queſtion cannot advantageouſly be managed upon any one uniform ſyſtem whatever; therefore judge, that the occupier acts with more wiſdom when he ſuits his rotation to the nature of the ſoil, than if he were to follow an uniform rotation, which, however correct upon general principles, may be totally unfit for certain parts of the farm which he occupies.

The 'Ayrſhire Survey,' and Mr Henderſon's 'Treatiſe on the Breeding and Management of Swine' will be reviewed in next number. We feel ſorrow at being unable at this time to overtake Mr Henderſon's treatiſe, eſpecially as the ſubject upon which he writes may, in ſeveral reſpects, be conſidered as a new one.

No. XLVIII. will be publiſhed on Monday, Dec. 9.

ERRATA IN LAST NUMBER.

p. 182. line 10. from bottom, for '*furrow ſoil*,' read '*furrow ſod*.'

p. 185. line 6. from bottom, for '*length of the beam*,' read '*length of the tenon*.'

ERRATA IN THIS NUMBER.

p. 310. 2d line from bottom, for '*ſeems*,' read '*ſeemed*.'

p. 344. 11th line from bottom, for 'take drilled beans, after that wheat, then barley,' read 'take drilled beans as the ſecond crop, and then barley.'

p. 360. line 2. from bottom, for 'puts out *five* ſtrings,' read 'puts out ſtrings,' and dele the word *five*.

D. William, printer.